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ABSTRACT

This bibliography of summaries and annotations of 3,801 studies in industrial education covers the period January 1, 1930, to August 31, 1955. The studies have been classified in categories reflecting the areas of research interest most often mentioned in inquiries and discussions: (1) Administration, (2) Guidance, (3) History and Trends, (4) Instruction, (5) Supervision, (6) Surveys, (7) Teacher Education, and (8) Types of Programs. The purpose of this publication is to help those who are seeking existing solutions to problems and those surveying the field in preparation for a new research effort. An author and subject index are given in VT 011 371; related documents are available as VT 011 369 and VT 011 371 in this issue. (GR)

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Research in Industrial Education

Summaries of Studies

1930–1955

Vocational Division
Bulletin No. 264

Trade and Industrial
Series No. 65

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Foreword

THIS BIBLIOGRAPHY of summaries and annotations of studies in industrial education covers the period January 1, 1930, to August 31, 1955. The studies have been classified in a series of categories that reflect the areas of research interest most often mentioned in inquiries and discussions. In submitting this system of classification, it has been recognized that other divisions could have been chosen but it was believed that this selection would prove most helpful.

Continuing technological advances and changing occupational patterns constitute a challenge for serious research in the field of trade and industrial education. This publication, compiling the existing effort in the field, should be helpful to those seeking existing solutions to problems as well as to those surveying the field in preparation for a new research effort.

The bulletin was prepared for publication under the general supervision of John P. Walsh, Director, Trade and Industrial Education Branch, Division of Vocational Education.

JAMES H. PEARSON,
Assistant Commissioner for Vocational Education.

Acknowledgments

THIS BULLETIN contains the material recorded in the American Vocational Association Bulletin No. 4, "Summaries of Studies in Industrial Education" for the period of January 1930 to September 1948; the "1953 Supplement, Summaries of Studies in Industrial Education" for the period of September 1948 to September 1950 and the studies for the period beginning August 31, 1950, and ending August 31, 1955. These materials were collected and edited by committees appointed by the National Association of Industrial Teacher Educators. An acknowledgment of credit for the splendid work done by individuals and committees was given in the preface of each of the earlier bulletins.

The Research Committees of the National Association of Industrial Teacher Educators assigned to the fact-finding phases of the projects were:

Summaries of Studies in Industrial Education, AVA Bulletin No. 4, 1949

Clarence T. Baab, Colorado State College of Education.
W. C. Bicknell, Southern Illinois University.
John L. Feirer, Western Michigan College of Education.
R. Lee Hornbake, University of Maryland.
H. H. London, University of Missouri.
Lynne C. Monroe, University of California.
William E. Warner, The Ohio State University.
Sylvan A. Yager, Indiana Teachers College.
C. Kenneth Beach, Chairman, Cornell University.

Summaries of Studies in Industrial Education, 1953 Supplement

Clarence T. Baab, Colorado State Teachers College.
Melvin L. Barlow, California State Department of Education.
E. W. Bollinger, New York State Education Department.
George B. Cox, Oregon State College.
Nelson A. Hauer, Louisiana State University.
Allen T. Hamilton, ex officio, Office of Education.
R. Lee Hornbake, University of Maryland.
S. Lewis Land, Pennsylvania State College.
H. H. London, University of Missouri.
Benjamin J. Novak, Murrell Dobbins Vocational-Technical School.
Joseph R. Strobel, Ohio State University.
Ralph C. Wenrich, University of Michigan.

Ray A. Wigen, The Stout Institute.
Clyde H. Wilson, University of Tennessee.
C. Kenneth Beach, Chairman, Cornell University.

Studies covering the period from August 31, 1950, to August 31, 1955

Melvin M. Barlow, University of California.
Earl B. Blanton, North Texas State College.
E. W. Bollinger, New York State Education Department.
George B. Cox, Oregon State College.
Charles Crumpton, University of Louisville.
Nelson Hauer, Louisiana State University.
George F. Henry, Colorado A. and M. College.
R. Lee Hornbake, University of Maryland.
Ivan Hostetler, North Carolina State College.
John W. Karnes, Jr., University of Connecticut.
Lewis S. Land, Pennsylvania State University.
Ralph Wenrich, University of Michigan.
H. H. London, Chairman, University of Missouri.

Gratitude is expressed to the American Vocational Association for the publication of AVA Bulletin No. 4 in 1949 and for the continuing interest that organization has shown in research in industrial education. Credit is due Gilbert G. Weaver, Chairman of the Committee on Research and Publication of AVA, for his leadership in seeing the 1949 project through to completion. The generosity of the Education Services, Ford Motor Company, Dearborn, Mich., in publishing the 1953 Supplement, "Summary of Studies in Industrial Education," is acknowledged. These expressions of appreciation would be incomplete if special credit were not given to Dr. C. Kenneth Beach of Cornell University, who as Chairman of the Research Committee of the National Association of Industrial Teacher Educators, compiled the data for the two bulletins covering the period from January 30, 1930, to September 1950.

This publication represents a compilation of the work of the previously mentioned committees. It was completed through the joint efforts of Gilbert G. Weaver of the American Vocational Association Research and Publications Committee; Dr. H. H. London, Chairman of the Research Committee of the National Association of Industrial Teacher Educators; and Dr. Allen T. Hamilton, Research Specialist, Trade and Industrial Education Branch of the Office of Education, who edited the materials supplied.

RESEARCH IN INDUSTRIAL EDUCATION

SUMMARIES OF STUDIES 1930–1955

Identifying symbols are used in this bibliography as follows: * indicates the study is available on microfilm; ♦ preceding an entry indicates a doctoral dissertation.

Administration

General

1. **ADCOCK, CECIL LEVERNE.** ***State Aid for Industrial Arts Education in the Public Secondary Schools of Louisiana.*** **M.S., 1952, Louisiana State University. 156 p. Library, Louisiana State University, Baton Rouge.**

Purpose: To ascertain whether or not special State aid allocated by the Louisiana State Legislature to assist in the support and expansion of industrial arts in the secondary schools of the State is meritorious and worthy of being continued.

Source of Data: Data were obtained from three separate questionnaires sent to the state superintendents of education in the forty-eight states, to parish and city school superintendents of Louisiana, and to principals of secondary schools of Louisiana.

Findings and Conclusions: Policies as to the appropriation and allocation of funds for the support of industrial arts differ among the states. All but three states were giving aid to industrial arts education, either through special appropriations or through funds allocated for general education. Special state aid for industrial arts education proved to be of value in those states where it was in effect. The majority of State Superintendents of Education had a favorable attitude toward state aid, either specific or general, for industrial arts education.

2. **APPLEGATE, HERSCHEL C. (Masters).** ***What Should School Administrators Know about Industrial Arts?*** **Ohio State University, 1931.**

3. **ARNDT, WILBERT C.** ***Trade Training Schools.*** **M. A., University of Minnesota, 1938. 63 p.**

A study of fields represented in three types of trade training institutions and their instructional practices and administrative plans.

4. **ASHLEY, LAWRENCE F. (M.A.)** ***Administrative Problems in Industrial Arts Organization with Special Reference to Shop Forms in the Secondary School.*** **Ohio State University, 1932 Published Western Arts, Ass'n Bulletin, 1933.**

The development and use of shop record forms for the industrial arts program. They are classed as follows: care of students, care of supplies, care of equipment, and care of the teaching staff. Criteria are established for developing record forms.

5. **BARDELMEIER, JULIUS E. (M.Ed.).** ***Administering An In-Service Professional Training Program for Day-Trade Teachers in Missouri.*** **Colorado Agricultural & Mechanical College, 1947. 61 p.**

An analysis to determine what kind of plan is needed. The advantages of in-service professional training and the administration of the plans are stressed.

6. **BEINERT, CARL JOHN.** ***Practices in Publishing, Managing, Printing and Financing Pupil-Produced Newspapers in the Public High Schools of Iowa.*** **M.S. in Ind. Ed., Iowa State College, 1940. 49 p.**

A study of practices and policies relating to the production of school newspapers and their implications for the industrial arts program.

◆

7. **BICKNELL, WILLIAM CLARENCE** (Ed.D.) *Constructional Activities in the Elementary Schools—Their Development and Use.* University of Missouri, 1942, 208 p.

A study concerning the European and American background, use, types, purposes, organization, methods of presentation, and administration of constructional activities in the elementary school.

◆

8. **BLAKELEY, THOMAS A.** *An Evaluation of the Administration of the Education Program at San Quentin Prison.* Ed.D., 1949, University of California at Berkeley. 297 p. Lange Library, Haviland Hall, University of California at Berkeley, Berkeley.

Purpose: To criticize and evaluate certain aspects of the administration of the educational program at San Quentin prison and to make recommendations.

Source of Data: The type of research used in this study is evaluation of current practice, setting up criteria, surveying current practice in the areas defined, and evaluation of current practices in terms of criteria.

Findings and Conclusions: Resocializations and attention to the individual are prime factors in a modern prison organization. The San Quentin educational program is closely allied with the administrative structure of the College of Marin. Recommend that a lay board of control (Board of Education of the Department of Corrections) be elected to control education in penal institutions. Duties of the administrative officers are not clearly defined. Prison officials are inconsistent in their cooperation with College of Marin and have failed to realize that their program is a cooperative one. Personnel should be selected on the bases of training, experience, ability, and personal fitness.

◆

9. **BLOCK, MURRAY H.** *An Evaluation and Recommendations for the Administration of the Technical program of the Evening and Extension Division of the Institute of Applied Arts and Sciences at New York City.* Ed.D., 1953, Columbia University. 280 p. Teachers College Library, Columbia University, New York.

Purpose: To review policies and procedures, to determine how the program fits the purposes of the school, and to make recommendations for improvement.

Source of Data: Data were obtained from readings, visits, and investigations to develop a background for interpretation; investigation of the different aspects of the administration, and then interpretation of the existing program.

Findings and Conclusions: Over eighty recommendations made with a view to improving administrative practices, improving the programs offered, making the best use of facilities, and relating the program to its purposes. When the institute is converted into a community college, the Evening and Extension Division will have to take the lead in relating the entire program to the life of the community.

10. **BOOTH, EDWARD L.** (Masters). *Administrative Aspects of a Related Technical Program for Industrial Apprentices.* University of Buffalo, 1943.

11. **BRUNTON, WILLIAM E.** (Masters). *A study of the Methods Used by the State Departments of Education in the U. S. to Provide Federal Aid and State Reimbursement for Trade and Industrial Courses in the Local School Districts.* University of Pennsylvania, c. 1935–47.

12. **BUXTON, ROBERT EDWARD** (M.S.). *Implications of the Six-Four-Four Plan for the Development of Industrial Arts and Vocational Education. Oregon State College,* 1947. 85 p.

An analytical survey of advantages and obstacles inherent in the 6-4-4 plan, with particular reference to the industrial arts area of the curriculum.

13. **CAMPBELL, ELI C.** (Masters). *Administrative Attitudes Concerning Nonprofessional Vocational Education in the Public School.* Oklahoma A & M College, 1940.

14. **CARTER, ERNEST.** *The Functions of School Administrators in Operating a Trade and Industrial Program.* M.S., 1949, Oklahoma Agricultural and Mechanical College. 70 p. School of Trade and Industrial Education,

Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the knowledge which school administrators should possess and the nature and extent of their duties in effectively promoting and operating trade and industrial programs.

Source of Data: Data were gathered through the use of questionnaires sent to superintendents, principals, trade and industrial teachers in Oklahoma, and State supervisors and heads of departments in 25 States, supplemented by interviews and conferences.

Findings and Conclusions: School administrators should be familiar with the objectives and aims of a trade and industrial program and with the regulations governing reimbursement from Federal funds. The principal and superintendent are responsible for: Promotion, supervision, administration (in accordance with State plan), scheduling classes effectively and the selection of students in cooperation with the industrial teacher.

15. CAST, THEODORE. *Problems of Industrial Arts as Seen by Educational Administrators of Rural Missouri.* M.Ed., 1952, Colorado Agricultural and Mechanical College. 64 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the attitudes and opinions of school administrators toward industrial arts.

Source of Data: Data were obtained through questionnaires from 44 school administrators offering industrial arts in their schools and from 44 school administrators not offering the program. Responses from each group were tabulated and analyzed for differences.

Findings and Conclusions: The majority of administrators from both groups favored the inclusion of industrial arts in the school curriculum. "Development of desirable habits and attitudes" was indicated as the dominant objective of industrial arts by administrators offering the program. "Development of skill" was the foremost objective as viewed by those administrators not offering industrial arts. Major reasons for not offering industrial arts were lack of space, lack of equipment, and original investment too high.

16. CHAMBERS, GEORGE FLORANT (M.S.). *Sequence and Time Requirements of Industrial Arts Courses in Junior High Schools,* Oregon State College, 1947. 116 p.

A comprehensive study of practices, opinions, and trends in the junior high schools of medium sized cities. Extensive quotations from leaders and supervisors are included. Detailed information on characteristics of present programs is listed and summarized.

17. COOKE, ROBERT LOCKE (M.A.). *Some Contributions of the Lick and Wilmeding Schools of San Francisco to the Administration of Vocational and Secondary Education.* University of California, Berkeley, 1930. 76 p.

A study of early trade schools in California and the educational philosophy of Geo. A. Merrill. The history of the Lick Wilmeding School is reviewed, and its impact on trade and terminal education is analyzed.

18. CROW, SHERMAN. *Place of the General Shop in a Centralized School Under a County System.* M. A., Kent State University, 1941. 74 p.

A study of the function of the general shop in the industrial arts program of a county school system.

19. CROZIER, DAVID WILLIAM. *Problems of Industrial Arts as Seen by Educational Administrators of Northwest Missouri High Schools.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 79 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the attitudes and opinions toward industrial arts of educational administrators of Northwest Missouri.

Source of Data: Questionnaires were sent to administrators in 116 schools in 19 counties, irrespective of whether industrial arts was included in their curriculums.

Findings and Conclusions: Administrators as a whole are in favor of offering industrial arts. Most of the problems encountered were due to lack of finances to operate a program. A more varied program than woodwork is desirable. Administrators favor having industrial arts teachers who are capable of teaching other subjects also.

◆

20. DAVISON, HAROLD J. (Doctors). *State Integration of Practical Arts and Vocational Education.* Ohio State University, 1931.

21. **DECK, WILLIAM L. (M.A.).** *Industrial Arts Program for Elementary Grades.* Southwest Texas State Teachers College, 1940. 149 p.

A study on the aims, content, method, and a pattern of organization for industrial arts in the elementary grades. The philosophy of industrial arts is treated; industrial arts is correlated with other subjects in the elementary school; and a course of study is set up.

22. **EARLY, JAMES MARSHALL (Masters).** *An Analysis of Practices in Administering Vocational Education in 55 City School Systems of the North Central Associations of Colleges and Secondary Schools.* Iowa State College, 1932. 110 p.

23. **FALLONA, HENRY DENNIS (Masters).** *Administration and Operation of the Vocational Educational Program in the Schools of Massachusetts.* Boston College, 1937.

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24. **FAWCETT, CLAUDE W. (Doctors).** *Administration of Education for Vocational Readjustment.* Yale University, 1943.

25. **FISHER, THOMAS (M.Ed.).** *Administration of the Vocational Readjustment Act of 1918.* University of Buffalo, 1946. 59 p.

A study of the vocational education programs for the veterans of World War I. Emphasis is on the administration of the programs by the Federal Board for Vocational Education.

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26. **FORKNER, HAMDEN LANDON (Ph.D.).** *Equalization of Federal Aid for Vocational Education.* University of California, Berkeley, 1939. 132 p.

An analysis of the basis for allocation of Federal aid for vocational education with recommendations for improvement.

27. **FORTNER, GARRETT H.** *Administrative and Supervisory Problems Involved in Operating a City Program of Vocational Education.* M. S., 1952, University of Tennessee. 87 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the administrative and supervisory problems involved in operating a city program of vocational education.

Source of Data: Data were obtained from directors of vocational education in twelve selected southern cities.

Findings and Conclusions: The local director generally has administrative authority over all areas of vocational education. The typical staff consists of a coordinator of day trade training, a coordinator of evening trade extension, a supervisor of distributive education, and a supervisor of veterans training. There are many administrative and supervisory duties for which the local director needs specific training.

28. **FREEMAN, GEORGE MARION.** *A Proposal for a State Supervisor of Industrial Arts for Kansas.* M.S. in Ind. Ed., Kansas State Teachers College, 1940, 46 p.

A survey of opinions of Kansas school superintendents relative to the need for a State supervisor of industrial arts.

29. **FUHLBRUEGGE, JOHN H.** *Vocational Education in Winona.* M.A., University of Minnesota, 1947. 89 p.

A plan for the organization, administration, and operation of several types of vocational education programs in a Minnesota city of 27,000 population.

30. **GODFREY, CHARLES.** *The Functions of Vocational Research Specialists in the Various States.* M.S., Oklahoma Agricultural and Mechanical College, 1948. 71 p.

A description of the research function performed in the vocational division of 37 State departments of education.

◆

31. **GRUBER, HERBERT H. (Ed.D.).** *A State Plan for Subsidizing Vocational Education in Pennsylvania.* Pennsylvania State College, 1942.

An analysis of the present plan for the apportionment of state and federal funds to local districts. A formula for apportioning vocational funds is developed in an effort to satisfy more effectively the objectives for which the funds were created.

32. **HAHN, CLYDE LEROY** (M.A.). *Opinions of School Administrators Toward Industrial Arts.* Colorado State College of Education, 1939. 105 p.

A study of the problems and opinions of school administrators-at-large toward industrial arts.

◆

33. **HEEP, RICHARD H.** (Doctors). *The Civilian Conversation Corps; A New Kind of Educational and Vocational Training.* Fordham University, 1939.

34. **HEFT, RUSSELL D.** (Masters). *A Survey of Industrial Arts Administration in the Wyandot County, Ohio, Schools.* Ohio State University, 1942.

◆

35. **HILL, FREDERICK WILLIAM** (Ed.D.). *A Plan for the Administration of a Program of Occupational Adjustment for the Youth of Rockland County, New York.* Columbia University, 1942. 204 p.

This study surveys and evaluates a county program of occupational adjustment which has been widely heralded as an example of the initiative which local communities may manifest in the solution of the problems of youth.

36. **HILLARD, LAWRENCE R.** (Masters). *A Comparison of Administrative Practices and Offerings in Vocational and Practical Arts Education in 30 Public School Systems.* Iowa State College, 1936.

37. **HOLCOMB, PAUL ELDON** (M.A.). *The Application and Administration of Educational Principles in the Air Corps Primary Flying School at Randolph Field, Texas.* University of Texas, 1933. 64 p.

A comparison of curricula and procedures employed in the Air Corps Primary Flying School, Randolph Field, Texas with educational principles found to be effective in public schools, with recommendations for improvement.

38. **HOLLEY, CHESTER O.** (M.S.). *A Study of Jacksonville, Florida to Determine Whether Its Present Program of Trade and Industrial Education Is Adeqaute. If not Adequate to Determine the Type of Program Which Would Meet the Industrial Training Needs of Its Workers.* Colorado Agricultural & Mechanical College, 1931. 122 p.

A study of the administration and supervisory organizations of the part-time schools and the evening schools to determine the deficiencies in the Jacksonville program. Modifications are suggested.

39. **HOLZAPFEL, ELMER W.** (M.S.). *Administrative Relationships of Superintendents and Industrial Arts Teachers in Small High Schools in Northern Iowa.* Iowa State College, 1937. 73 p.

An analysis of the opinions of the administrators of sixty-seven public schools in northwest Iowa concerning administrative relationship problems connected with industrial arts teachers and industrial arts departments.

◆

40. **HOSTETLER, IVAN** (Ed.D.). *An Analysis of Opinions on Industrial Education with Their Indications for a Program in the Public Schools.* University of Missouri, 1945. 226 p.

A study concerning the views of labor, management, and educators toward fifty issues involved in planning and operating programs of industrial education in the public schools.

41. **HUBBARD, HARRY NILES** (Masters). *Relationship between Industrial Arts and Vocational Trade and Industrial Education.* University of Alabama, 1936.

42. **ILLINGSWORTH, C. W.** (M.S.). *Vocational and Adult Education in Wisconsin—Administration and Supervision.* The Stout Institute, 1940. 603 p.

A description of the administrative and supervisory duties in Wisconsin schools of vocational and adult education, including the phases of apprenticeship, co-ordination, circuit teaching, rehabilitation work, the teacher and his job, and the range of the system.

43. **JOHNSON, SCOTT E.** (Masters). *Conditions of the Homes of Sam Houston High School Students and Implications for Industrial Education.* Hampton Institute, 1945.

◆

44. **KARNES, JOHN W. Jr.** ***The Organization and Administration of Industrial Education on the State Level.*** **Ed.D., 1951, University of Missouri. 253 p. Library, University of Missouri, Columbia.***

Purpose: To analyze the qualifications of professional personnel in the industrial education division of state departments of education; to identify areas of work with which they are concerned, along with what functions they do and/or should perform; and, to record the ideas and opinions held by various groups of educators concerning some issues confronting industrial education at the state level.

Source of Data: Data were obtained through five different inquiry forms from state directors of industrial education, industrial teacher educators, public school superintendents, local directors of industrial education, and teachers of industrial education at the local level. All forty-eight states were represented.

Findings and Conclusions: Few specialists are employed. The greatest need for additional professional personnel is in the general rather than specialized positions. Divisions of state departments of education concerned with both industrial arts and vocational-industrial education should be designated as "industrial education." Industrial education personnel in state departments should perform more functions relating to local assistance, research, and apprenticeship. Except where size does not warrant, the organization of states into districts or regions with professional personnel in charge of each, will probably facilitate administration and supervision in the statewide program. All phases of industrial education should be administered and supervised by a single agency in the state department of education under the direction of a professionally qualified person. Certain professional courses in industrial education should be designed for teachers in all phases of industrial education. Coures designed to give a practical understanding of the objectives and philosophy of all phases of industrial education should be included in the professional preparation of principals and superintendents.

45. **KEUSCH, SAMUAL JOSEPH (Masters).** ***Health Problems in Relation to Industrial Arts.*** **Ohio State University, 1938.**

46. **KUMPULA, WESLEY A. (Masters).** ***Selected Teacher Activities in Industrial Arts Pertaining to Administration and Supervision.*** **Wayne University, 1945.**

◆

47. **LANG, EDWARD HILL (Ed.D.).** ***The Organization and Administration of the Program of Vocational Education for National Defense in New York State.*** **New York University School of Education, 1942. 385 p.**

The development of defense training programs including instructional material and a critical discussion of the organization and administration of the defense training program. An historical survey of the legislation, current practices, and development of vocational education are discussed.

48. **LEIGHBODY, GERALD B. (M.Ed.)** ***Problems of Administration of the War Industries Training Program in the Vocational and Technical High Schools of Buffalo, New York.*** **University of Buffalo, 1943.**

A study of the organization, supervision, and administration of a program of short intensive courses designed to train for highly specific jobs. Particular reference is made to the selection and preparation of teachers.

49. **LYNN, FOREST LaVERN (M.S.).** ***The Organization and Administration of Vocational Courses in Electricity in Junior Colleges.*** **University of Southern California, 1941. 156 p.**

A study discussing the aspects of junior college courses in electricity, with special emphasis on justification for such courses, on criteria to aid in organizing such courses, and on equipment and appropriate tests and measurements.

50. **MAULDIN, HENRY E. (Masters).** ***A Review of Some of the Administrative Problems in Vocational Education in Mississippi, 1917–1942.*** **Mississippi State College, 1943.**

51. **MORTLEY, FLOYD (M.A.).** ***Problems of Industrial Arts as Seen by the School Administrators in Kansas.*** **Colorado State College of Education, 1941. 110 p.**

A study showing the problems, opinions, and attitudes toward industrial arts as seen by school administrators of Kansas.

52. NORDEED, VERN THEODORE. ***The Industrial Arts Teacher Athletic Coach Combination in Schools of Western Iowa.*** **M.S., Iowa State College, 1939. 126 p.**

A study of the difficulties encountered by industrial arts teachers, who also coach athletic teams, in keeping up with their primary teaching duties, preparation, and out-of-class service to pupils.

53. PANTON, HARRY A. (M. Ed.). ***Developing and Administering a Curriculum in Technical Drafting for a Vocational Secondary School.*** **University of Buffalo, 1948. 113 p.**

An historical study of the aims, needs, methodology, administration, and evaluation of a vocational high school in Niagara Falls. A course of study in drafting and mathematics is suggested.

54. PARENT, CHARLES A. (Masters). ***Elements Involved in the Organization and Administration of Secondary School Industrial Arts.*** **University of Wisconsin, 1931.**

55. POYZER, MARVIN F. (M.A.). ***Problems of Industrial Arts as Seen by Educational Administrators of North Dakota.*** **Colorado State College of Education, 1948. 67 p.**

An investigation covering the problems, attitudes, and opinions of school administrators of North Dakota toward industrial arts.

56. RESIDES, GEORGE H. (M.S.). ***Organization and Administration of Shop Courses for Trade and Industrial Teachers.*** **Pennsylvania State College, 1931. 43 p.**

Presents an outline of courses to be used in woodworking, machine, foundry, welding, and art metal shops by semesters for a four year college curriculum in industrial education.

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57. ROSS, BENJAMIN P. (Doctors). ***The Origin, Development and Administration of the Rural-Community Vocational Schools in Pennsylvania.*** **Pennsylvania State College, 1944.**

◆

58. ROWNTREE, URWIN. ***Guiding Principles of Vocational Industrial Related Instruction.*** **Ed.D., 1951, University of Pittsburgh. 155 p. Library, University of Pittsburgh, Pittsburgh, Pennsylvania.**

Purpose: To develop a list of guiding principles for vocational related instruction under the categories of curriculum construction practices, administrative organization, and teaching methods.

Source of Data: Data were obtained by a check list of 138 principles prepared and submitted to 784 vocational administrators, shop and related teachers in the Commonwealth of Pennsylvania.

Findings and Conclusions: There are many principles of vocational-related instruction with which vocational personnel are in high agreement as desirable principles to follow. In a number of cases there was high agreement between theory and practice. Practice lagged considerably behind theory with respect to many principles. There is uncertainty about the desirability of certain principles. The findings of the study resulted in a list of 78 guiding principles which are rated highest to lowest by per cent of relative acceptance of the principles.

59. SANER, J. W. (Masters). ***An Analysis of the Pennsylvania Five-Year State Plan for Vocational Education Under the Smith-Hughes and George Deen Acts, July 1, 1937 to June 30, 1942, Part IV Trade and Industrial Education.*** **University of Pennsylvania, 1943.**

60. SARCHETT, ALVIE MILO. ***Techniques For Promoting, Administering and Evaluating an Adult Education Program in a Community College.*** **M.S., 1950, Iowa State College. 77 p. Library, Iowa State College, Ames.**

Purpose: To evaluate and improve the techniques used in the development of a community college program in Mason City, Iowa.

Source of Data: Data were gathered from records of the Mason City Junior College, Mason City, Iowa.

Findings and Conclusions: Adults must be aware of possibilities of adult education and the program must be based on their needs and those of the community. A satisfactory plan to administer the program must be made.

61. **SCHAEFER, ORVINE H. (M.A.).** *Problems of Industrial Arts as seen by the Educational Administrators of Iowa.* Colorado State College of Education, 1941. 92 p.

A survey of the problems and opinions toward industrial arts as reported by the school administrators of Iowa.

62. **SCHULZE, HENRY W. (M.S.).** *Co-operative Trade Training Programs —A Study of the Controlling Factors of Administration as Found in Secondary Schools of Representative Cities.* The Stout Institute, 1938. 79 p.

A description of the controlling factors in the administration of co-operative trade training programs that are being conducted as a part of the regular secondary school program. The study is based on a survey of 112 co-ordinators in charge of such programs in thirty-one states.

63. **SHILLINGER, MICHAEL WILLIAM.** *A Study of Changes in the Election of Industrial Arts Subjects in South High School During the Years From September 1936 to June 1940.* M.A., University of Michigan, 1940. 44 p.

Survey within a single building, over a 4-year period, of changes in elections in industrial arts subjects accompanying a change in scheduling due to changes in length of periods.

64. **SHULTIS, CLARENCE GILSON (M.S.).** *Administration of Industrial Arts Materials and Equipment in Colleges and Secondary Schools of the Southern Association.* Louisiana State University, 1941. 126 p.

A survey of existing administrative and personnel problems in industrial arts, in the colleges and secondary schools of the Southern Association, together with proposed methods for meeting these problems successfully.

65. **SMITH, FARMER S. (M.A.).** *An Administrative Plan of Vocational Education for Raleigh, North Carolina.* University of North Carolina, 1942. 73 p.

A presentation of the industrial arts and vocational education programs of Raleigh, North Carolina. A plan for vocational education was prepared, based on an occupational survey made in Raleigh.

66. **SNYDER, S. S. (M.S.).** *A Suggested State Plan for Mechanic Arts Education in the Seventh to Twelfth Grades of the Colorado Public Schools.* Colorado Agricultural & Mechanical College, 1933. 75 p.

An outline for a state program for mechanic arts education in Colorado. The plan deals with administration, supervision, shops, objectives, and courses, based on information obtained from systems in Florida, Missouri, Texas, and Washington.

67. **TISCHENDORFF, ELBERT W. (Masters).** *Developing Suburban Industrial Arts and Industrial-Vocational Education Programs.* Ohio State University, 1931.

68. **VERGARA, JOSE R.** *The Extent of Staff Participation in the Administration and Supervision of the Technical Education Program of the Philippine School of Arts and Trades.* M.A., 1952, The Ohio State University. 104 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the extent of staff participation in the administration and supervision of the technical education program of the Philippine School of Arts and Trades.

Source of Data: Data were obtained from a check list which was submitted to the school staff.

Findings and Conclusions: The instructional phase of the program received less attention than the administrative and supervisory phase. The teachers operate within a framework of policy and practices established by the administration in cooperation with the supervisory staff. The absence of the application of group processes in developing a cooperative and democratic environment was noticeable. There is a need for identifying specific responsibilities and in assigning them to qualified members of the staff.

69. **WATTS, E. J. (Masters).** *Methods of Administration of Supplies and Materials for Industrial Arts Woodworking Classes in Texas.* A & M College of Texas, 1933.

117. **WESTERBERG, HERMAN ERWIN (M.A.).** *Difference between General Vocational School Graduates and Boys Who Dropped Out before*

Graduation. University of Maryland, 1946. 54 p.

A comparative study based on the records of pupils who attended a vocational school during 1940, 1941, and 1942 to determine how the graduates differed from the drop-outs. Consideration is given to the administrative implications that may be drawn from these differences.

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71. **WILMOTT, JOHN NELSON** (Ph.D.) *High School Boys Electing Industrial Arts; a Study of Certain Factors Differentiating the Industrial Arts Group from the Group not Electing Industrial Arts, New York.* Columbia University, 1941. 71 p. Published: Bureau of Publications, Teachers College, Columbia University, 1941.

A comparative study to determine the extent and type of certain differences that may exist between the two groups, and to point out their implications for school administrators, curriculum committees, industrial arts teachers, and supervisors.

72. **YARNELL, EDWARD A.** *The Functions of Administration and Supervision of Industrial Arts in the Secondary Schools of Ohio.* M.A., 1952, The Ohio State University. 66 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the extent and nature of the titles used to denote administrative responsibilities and the functions performed by the holders of these titles.

Source of Data: Data were obtained from a questionnaire sent to the 181 schools in Ohio having the desired qualifications.

Findings and Conclusions: The five largest of thirteen categories of titles were: teachers, instructors, department head, chairman, and supervisors. Most respondents performed some classroom teaching, had responsibility for the selection and ordering of supplies and equipment, and helped with records and reports. Few had part in scheduling studens, or selection and supervision of teachers. Nearly one half performed guidance activities. A majority participated in curriculum, shop, and program planning. Seventy-three percent received additional compensation. Most respondents were acting in the dual capacity of both teacher and administrator. Teacher education institutions should include training in departmental administration in the industrial arts curriculum.

73. **YUGEND, LENA** (Masters). *Factors Influencing Results in Vocational Training.* Smith College, 1939.

Advisory Committees—Management Labor Attitudes

74. **COX, JACK HOOK.** *The Organization and Function of a General Advisory Committee For Practical Arts and Vocational Education.* M.A., 1954, University of Alabama. 60 p. Library, University of Alabama, University.

Purpose: To develop a systematic method of organizing a committee to advise a local board of education in respect to vocational and practical arts education and to identify the duties and functions performed by such a committee.

Source of Data: Data were obtained from a review and analysis of pertinent literature relative to advisory committees and from interviews and discussions with school personnel having experience with advisory committees.

Findings and Conclusions: Eleven principles relative to the organization of a general advisory committee for vocational and practical arts education were formulated. Sixteen principles relative to the duties, functions, and method of operations are included.

75. **DAVIE, MOSE JEPTHA.** *The Attitudes and Practices of the Nashville Building and Construction Trades Unions Toward Vocational-Industrial Education and Negro Artisans in Nashville.* M.S., 1954, Tennessee Agricultural and Industrial State University. 62 p. Library, Tennessee Agricultural and Industrial State University, Nashville.

Purpose: To obtain information concerning the attitudes and practices of the unions in the Nashville Building and Construction Trades Council toward vocational-industrial education and Negro artisans in this community.

Source of Data: Official representatives from 24 craft unions in the Nashville Building and Construction Trades Council were interviewed. Historical data were secured from documents, records, and available literature.

Findings and Conclusions: The majority of unions in this group have no Negro membership. Negro graduates from vocational schools have not been accepted into the unions. Only the services of Hume-Fogg Technical and Vocational High School have been used by the unions for their apprenticeship training programs.

76. DOYLE, JOHN C. ***Organization, Operation and Curriculum of Selected Labor Colleges in the United States.*** **M.S. in C., St. Louis University, 1942, 94 p.**

A descriptive summary of the organization, operation, and curriculum in 22 labor colleges in the United States established since 1902.

77. FOLTMAN, FELICIAN FRANCIS (M.S. in Ed.). ***Attitudes and Policies of Certain Organized Labor and Industrial Management Organizations in Respect to Vocational Industrial Education, 1930 to 1947.*** **Cornell University, 1947. 191 p.**

A comparative study of the educational attitudes and policies of organized labor and organized management associations toward vocational industrial education, based on the literature in the field as well as on personal interviews.

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78. KARNES, M. RAY (Ph.D.). ***Evolving Concepts of Industrial Education in the Thinking of Organized Labor.*** **University of Missouri, 1948. 397 p.**

A study tracing the origin and development of ideas and attitudes toward industrial education on the part of organized labor from 1880 to 1948, as reflected in published reports and records. Topics include labor's early interest in industrial education, union programs, organized labor and the national movement for vocational education, and the evolution of labor's attitudes and policies on specific issues in industrial education.

79. MALIN, WILLIAM E. ***Labor and Education in America: A Survey of the Educational Attitudes and Objectives of Organized Labor and the Development of Workers' Education.*** **M.A., 1950, University of California. 181 p. Lange Library, Haviland Hall, University of California at Berkeley.**

Purpose: To ascertain some of the major aims and objectives of organized labor's attitude toward education and their own program of workers' education.

Source of Data: Survey of the pattern of public education desired by labor. A sketch of the development of labor's own program. Drawing of conclusions as to implied objectives of labor's attitude and policy.

Findings and Conclusions: The study traced the historical development as follows: Development of educational policies—labor and education to 1880, modern labor unions and education; development of labor's educational program—union groups, national agencies, resident labor colleges, workers' education in college; working toward a philosophy—development of objectives, modern unionism and education, and labor's own program.

80. MAYER, CONRAD. ***Labor and Education in Wisconsin.*** **M.S., 1950. The Stout Institute, 83 p. Library, The Stout Institute, Menomonie, Wis.**

Purpose: To procure evidence concerning the interests and attitudes of the Wisconsin State Federation of Labor in education with emphasis on industrial education.

Source of Data: The historical and normative survey type of educational research was employed.

Findings and Conclusions: It was found that the interest of the Wisconsin State Federation of Labor in education is a comprehensive interest embracing the following subjects: Child welfare, teacher welfare, finance, curriculum, higher education, workers' education and industrial education. Organized labor in the State of Wisconsin has a major interest in industrial education. It is recommended that data presented in the study be used to make for a better understanding and relationship between organized labor and the school.

81. ROHN, H. B. (Masters). ***A Study of the Activities of the Local T. and I. Advisory Committees in the Eastern Coordinator Area of Pennsylvania.*** **University of Pennsylvania, c. 1935–47.**

82. SEAMAN, THEODORE J. (Masters). ***Study of the Opinions of Labor and Management in Regard to Industrial Education for Sandusky, Ohio.*** **Ohio State University, 1946.**

83. SHALLOO, DANIEL F. (M.A.). ***The Influence of the American Federation of Labor Upon the Curriculum of the Public Schools.*** **Catholic University of America, 1937. 39 p.**

A study of the attitudes of the American Federation of Labor toward public education, from the time of its origin until the postwar period following World War I, and their influence on the training of the children of the workers of America.

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84. STUART, IRVING R. *A Study of Factors Associated with Inter-Group Conflict in the Ladies Garment Industry in New York City.* Ph. D., 1951, New York University. 218 p. Library, New York University, New York.*

Purpose: To ascertain the nature and extent of the relationship, if any, between intergroup economic competition and racial and nationality discrimination in the ladies garment industry in New York City.

Source of Data: The experiences of white foreign-born immigrants were compared with those of colored migrants and immigrants. Data were drawn from surveys conducted by government and private sources concerned with the problem as well as interviews with workers and officials of the largest labor union in the industry. In addition, access to verbatim stenographic reports of the Grievance Board of the Union was also permitted and used as illustrations of grievances.

Findings and Conclusions: Prejudice and discrimination toward racial and nationality minority groups are most often based upon the economics of the relationship between the groups. Acceptance of minority group workers by employers, and the consequent acceptance by the workers themselves, is conditioned by the docility of the newcomer. The position of the Negro in this industry is uncertain because Negroes do not regard this type of work as being on a social level which they consider to be desirable and at the same time this industry is one of the few which places them on an equal level with Whites. Grievances between union members on ethnic lines are rare.

85. WITTEVRONGEL, M. A. *Successful Programs in the Organization and Use of Advisory Committees.* M.Ed., 1951, Colorado Agricultural and Mechanical College. 73 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To examine successful programs of organization and use of advisory committees and to formulate a plan of organization to be used in East Moline, Illinois.

Source of Data: Data were obtained through questionnaires from 37 supervisors, 21 of whom had advisory committees, from 11 state directors of vocational education, and from government bulletins, books, and professional magazine articles.

Findings and Conclusions: Over-all committees were not always equally represented by employers and employees. There was equal representation in only 50 per cent of the committees. Ninety per cent of the craft committees reported were made up of equal numbers of employers and employees. Schools were represented on 86 per cent of the overall committees and on 95 per cent of the craft committees. In 76 per cent of the programs studied, the organizations represented were permitted to select their representatives. The study indicated an increasing use of advisory committees.

Building Construction

86. ASH, LANE C. (Masters). *A Determination of the Factors which Should Control the Planning of Efficient Housing Facilities for Vocational Trade and Industrial Programs in Pennsylvania.* University of Pennsylvania, c. 1935–47.

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87. BOWERS, VICTOR LEE (Ph.D.). *American Housing and Industrial Arts Education.* Ohio State University, 1941. 314 p.

A study of the housing industry: its structure, processes, procedures, and researches. Basic material is analyzed to show the role which industrial arts can play in orienting the public to appreciation of proper housing.

88. CLANTON, WILLIAM L. *The Prefabricated Housing Industry: Implications for Use as Industrial Arts Content.* M.A., 1950, Ohio State University. 249 p. Education Library, Ohio State University, Columbus.

Purpose: To provide information about prefabricated housing and to interpret these data for the industrial arts profession.

Source of data: Descriptive and historical research methods were employed, with data being secured from books, magazine and newspaper articles, brochures and letters from prefabricators, government agencies and Home Manufacturers Institute.

Findings and Conclusions: Industrial arts teachers must discard the narrow confines of part concepts and prepare for a more complete and flexible interpretation of technology. The largest financial transaction in which most persons are involved in their lifetime concerns the purchase of a home, and the profession could do much toward educating future home owners by enriching its programs with home building studies. In interpreting technology it is imperative that as many phases of the technology be dealt with as are physically possible and not by going on tangents by reaching rigid, specific areas.

89. CRITES, ROY VINCENT (M.A.). *A Study in Design for an Industrial Arts Building.* University of California at Los Angeles, 1943. 350 p.

An investigation of the design of equipment used in American senior industrial arts high schools in 1943. Sound and unsound principles of building construction and problems raised by variations among communities and budgets are treated.

90. CULP, ROBERT LEWIS. *The Planning and Construction of the New Industrial Arts Laboratories in San Marino, California.* M.Ed., 1953, The Ohio State University. 40 p. Library, The Ohio State University, Columbus.

Purpose: To provide an accurate record of the processes involved in planning a new high school industrial arts laboratory.

Source of Data: Data were obtained from an anecdotal record.

Findings and Conclusions: A floor plan including machine and equipment locations was developed. Equipment lists were prepared and equipment ordered. A series of course outlines were prepared.

91. CUMMING, TROY SAMUEL. *Considerations and Recommendations for the Planners of Small Industrial Arts Laboratories in Florida.* M.S., 1951, Florida State University. 46 p. Library, Florida State University, Tallahassee.

Purpose. To set forth the principles that should be used as a guide in making a general shop layout.

Source of Data: Data were obtained from research papers, questionnaires, and current school trends.

Findings and Conclusions: School shops must be designed to meet special community needs as well as to provide general industrial understandings.

92. DESHA, WILLIAM SPENCER (M.S.). *The Number of Students Electing Industrial Arts as a Basis for Determining Housing and Equipment Needs.* Louisiana State University, 1948. 118 p.

A study to determine the nature and amount of equipment and housing needed in industrial arts by surveying enrollment, status, and needs of departments existing in accredited public schools in 1947–1948. A plan for shop organization is included.

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93. EATON, MERRILL THOMAS (Ed.D.). *A Curriculum in Home Planning, Building and Maintenance.* Indiana University, 1932. 444 p.

An analysis of the problems of home planning, building, and maintenance that are essential to home-owners and prospective home-owners of the "middle-class." These data are used as a basis for a curriculum for high school boys and girls in home planning, building, and maintenance.

94. RICHARDS, LEON WALTER. *Planning Industrial Arts Laboratories, A Study of the Principles in the Development of Layouts.* M.A., 1951, The Ohio State University. 85 p. Library, The Ohio State University, Columbus.

Purpose: To provide a set of principles that the average teacher might follow in planning a school shop, and to provide a basis for teaching shop planning courses.

Source of Data: Data were secured from library materials, interviews and correspondence.

Findings and Conclusions: A group of twenty-nine principles of primary concern in planning the general industrial arts shop layout were developed.

95. ROBERSON, FRITZ D. *A Study of Building Materials and Processes and Their Influence on the Design and Construction of Contemporary Small Homes.* M.S., 1950, North Texas State College. 95 p. Library, North Texas State College, Denton.

Purpose: To investigate the most common new building materials and to determine how their uses are changing the design of modern small home architecture in Texas and adjoining States.

Source of Data: An examination was made of books concerned with contemporary designs, periodicals, professional literature and pamphlets printed by representative companies describing their products. The information thus compiled was then arranged to show how changes have come about in the structural and external design of contemporary small homes.

Findings and Conclusions: In recent years the use of steel, reinforced concrete and laminated wood framing members have introduced an entirely new method of construction. This construction allows relatively low cost housing while at the same time permitting a vast expansion of ideas in the design of such homes. Built-up roofs and concrete slab floors have allowed the houses to be built lower. Plate glass has opened the rooms into spacious areas while other forms of glass now being manufactured offer the builder a wide choice in functional or decorative uses never before possible. Prefabricated storage units and improved kitchen and laundry utilities have contributed greatly to the elimination of movable furniture and the room arrangement in the modern house.

96. THOMPSON, Anson W. *Suggested Industrial Arts Building Program Coordinated With Vocational Agriculture For High Schools in Rural Communities With A. D. A. of 300 to 500.* M.A., 1954, Chico State College. 53 p. Library, Chico State College, Chico, California.

Purpose: To plan an industrial arts building program coordinated with vocational agriculture for high schools with an A. D. A. of 300 to 500, and to furnish suggestions for adequate shop facilities for a well-rounded shop program suited to the two areas.

Source of Data: Data were obtained from published material and personal contacts with those most directly concerned in school shop planning.

Findings and Conclusions: The modular type of construction, elongated design, preferably in sections with two or three shops in each section, has advantages in teaching efficiency, student morale, student control, and consideration of future needs that ought not be overlooked. The report included three basic designs with suggestions for tools and equipment. State recommendations are incorporated.

97. TOLLEY, ARTHUR ROBERT. *Establishing a Program and Equipping a New Industrial Arts Laboratory For Trenton High School.* M.Ed., 1954, University of Cincinnati. 126 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To plan the construction of a new industrial arts laboratory based upon a philosophy, a planned program of study, and selected tools, equipment, supplies and materials.

Source of Data: Data were secured from publications on industrial arts, suppliers catalogs, and tool and supply lists.

Findings and Conclusions: The report contains a detailed plan of development for an industrial art sprogram, including shop layout and equipment.

Costs—Control—Budget

98. ANDERSON, WARD. *A study and Evaluation of Certain Practices of the Financial Administration of Industrial Arts Departments in Class "A" High Schools of Texas.* M.S., 1951, North Texas State College. 65 p. Library, North Texas State College, Denton.

Purpose: To ascertain and evaluate practices used in administering the finances of industrial arts programs operating in grade "A" high schools in Texas.

Source of Data: Data were secured through a questionnaire and from professional literature.

Findings and Conclusions: There are many different financial systems being used. More teacher preparation in college is needed in this area.

99. ARUNDEL, JOHN F. (Masters). *An Analysis of Pupil Costs in Vocational Education in the Cincinnati Public Schools for the Year 1929–1930.* University of Cincinnati, 1931.

100. BARR, JOHNNIE HUBERT (M. S.). *The Per Capita Cost of General Metal Materials in the Houston High Schools.* A & M College of Texas, 1938. 51 p.

Investigates per capita cost of general metalwork materials in grades 6, 7, and 8, in Houston junior high schools. Suggestions for suitable programs and projects are offered.

101. BOHNING, FREDERIC W. (M.S.): *Finance Methods Used by Industrial Arts Teachers in Iowa.* Iowa State College, 1933. 38 p.

A survey of the finance methods used by 116 schools in Iowa for buying industrial arts materials and supplies and selling them to the students.

102. BOYD, RICHARD L. *A Study to Develop and Propose a System of Industrial Arts Accounting and Bookkeeping for the Secondary Schools of Fort Worth, Texas.* M.S., 1950, North Texas State College. 74 p. Library, North Texas State College, Denton.

Purpose: To develop and propose a system of industrial arts accounting and bookkeeping for the secondary schools of Ft. Worth, Texas.

Source of Data: A survey of facts and opinions of the instructors of industrial arts of Ft. Worth, Texas, and the supervisor of industrial arts of the Ft. Worth Public Schools to serve as a basis for accounting and bookkeeping system.

Findings and Conclusions: A comparison of the data contributed by instructors and supervisors of industrial arts and opinions and recommendations of administrators, resulted in the following conclusions: Keeping accurate records is important, is an unwanted task, records were not kept according to a standard system, most teachers need further preparation in accounting, only 11 percent have preparation, a standard system is needed, administrators were against collecting the money in the business office of each school, any system will often vary according to the administrative policies governing the school, and a good system of accounting and bookkeeping for industrial arts shops is one that will enable the instructor to record the desired information with a minimum of time and effort.

103. BRITTON, RUSSELL K. (M.S.). *Extending Vocational Educational Opportunities Through the Control of Instructional Costs.* Colorado Agricultural & Mechanical College, 1940. 77 p.

A study showing a way of giving instruction to more students in the present classes and offering more courses without increasing the total cost of instruction.

104. BROAKS, MARK F. (M.S.). *A Study of the Relative Cost of Teaching Industrial Arts and the Average Cost of Teaching All Other Subjects in the High Schools of Thirty-Two Cities in the State of Kansas for the School Year 1927–1928.* Iowa State College, 1930. 152 p.

A study of the relative cost of teaching industrial arts and the average cost of teaching all other subjects in the high schools of thirty-two cities in the state of Kansas for the school year 1927–1928.

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105. BUNTEN, CHARLES A. *Selecting, Purchasing, Issuing, Financing, and Accounting for Industrial Arts Supplies in the Secondary Schools of Missouri.* Ed.D., 1955, University of Missouri. 188 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain the current practices used in the procurement and management of industrial arts supplies in Missouri, to ascertain the costs and problems of financing industrial arts supplies in the state, and to ascertain the extent to which current practices coincide with practices recommended as desirable by a group of specialists in the field of industrial arts.

Source of Data: Data were obtained through information forms from 329 industrial arts teachers in the state and from 50 specialists composed of 12 state directors or supervisors of industrial arts, 18 local supervisors of industrial arts, and 20 industrial arts teacher educators.

Findings and Conclusions: Other than practices relating to the distribution of supplies, the Kansas City and St. Louis schools are following the practices recommended by the specialists to a greater extent than are the out-state schools. In comparing the practices of all schools with those recommended by specialists, there is some agreement and many differences concerning the selection of supplies; more agreement than disagreement concerning the purchase of supplies; general agreement on the storage of supplies; disagreement on the issuance of supplies; general agreement on the financing of supplies and vast disagreement on the accounting procedures and the forms to use in keeping supply records.

106. CAREY, ROBERT E. (M.S.). *A Comparative Study of Cost of Instruction in Industrial Arts and Other Forms of Education in Senior High Schools of Six Fourth Class Districts in Luzerne County,* Pennsylvania State College, 1937, 59 p.

A comparative study, based on questionnaires, interviews, and historical documents, of the relative costs of the general education areas with the cost of an industrial arts program.

107. COLEMAN, JOHN B. (M.S.). ***Efficient Financial Control and Accounting for Vocational Schools.*** **Colorado Agricultural & Mechanical College, 1937, 313 p.**

A study of how a vocational school director can control school finances efficiently. A plan is suggested that aims to satisfy the personal wants of the director and to control public money and property efficiently.

108. COTTER, JAMES, *Jr.* *Methods for Financing Materials and Supplies for Industrial Education in Michigan Public Schools.* M.Ed., 1949, Wayne University. 39 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To set up a sound system of financing industrial arts programs.

Source of Data: Data were obtained from a questionnaire sent to industrial education teachers in twenty-one towns and cities in southeastern Michigan.

Findings and Conclusions: Four different plans for financing materials and supplies were found to be used, each with certain advantages and disadvantages. The system recommended by the author consists of the school buying the material and selling it to the student.

109. COWHERD, W. CHAD (M.S.) ***Per Pupil Cost of Instruction for a Diversified Occupational Program in Monett, Missouri.*** **Colorado Agricultural & Mechanical College, 1941. 79 p.**

A study to determine ways and means by which the diversified occupations programs can be made more effective without increasing costs.

110. DAVIDSON, JOHN TAYLOR. ***Cooperative Buying in Industrial Arts on a Tri-County Basis.*** **M.S., 1952, Oregon State College. 97 p. Library, Oregon State College, Corvallis.**

Purpose: To ascertain the feasibility of group buying in order to take advantage of discounts, and to develop a plan for cooperative buying in industrial arts for a group of industrial arts teachers in small city school systems.

Source of Data: Data were secured from teachers, supply houses, and directors of industrial arts.

Findings and Conclusions: Small schools may profitably cooperate in their purchases. Supply houses are willing to bid on group orders. A standard method of budget preparation and purchasing has not been adopted by the schools in the area studied.

111. DAVIS, DEAN BRADY. ***Financing Instructional Materials in Industrial Arts Education in the Schools of North Carolina.*** **M.S., 1950, North Carolina State College. 88 p. Library, North Carolina State College, Elizabeth City.**

Purpose: To develop a satisfactory method of financing instructional materials in industrial arts in North Carolina.

Source of Data: A study was made on the methods of financing instructional materials in use through personal interviews with the school administrators and questionnaires sent to the industrial arts teachers.

Findings and Conclusions: The following recommendations were made: School boards should allot money for a period of one year. The allotments by the school board should be made on a "per pupil" basis for equal distribution. The instructor should be granted a petty cash fund for purchases of special or small items needed. A specific amount should be set aside each year for repair to tools and materials. A specific amount should be set aside each year for new equipment. The student should pay the fee *before* starting the course. The student should pay fees to a central office in the school. The school administrative unit should require the same fees in all schools in that unit. The cost of materials for projects outside the shop should be paid by the department or agency requesting them. The instructor should purchase the materials needed either personally or by requisition. The student should be responsible for paying all money to the central office. No instructor should handle money in his shop or classroom. A "purchase card" should be sold by the central office to eliminate handling money in the shop. Students should purchase the materials ticket for use in the shop when acquiring materials. Refunds should be made to the student for any amount left on the purchase card at the end of the year.

112. DAWLEY, HOMER CARROLL. *Procedures of Industrial Arts Teachers in Providing Supplies in Selected Southern California High Schools.* M.S., 1954, Oregon State College. 91 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain procedures followed in providing supplies for students.

Source of Data: Data were secured through a questionnaire sent to the industrial arts teachers in eleven California counties.

Findings and Conclusions: There is a wide range in industrial arts budgets. Storage facilities are inadequate and inconvenient. A large minority of industrial arts teachers are not satisfied with their distribution system and many expect to change. Procurement, storage, distribution, and accounting of supplies requires too much of the teacher's time.

113. DOTY, RALPH EDWARD. *Finance Methods and Records of Industrial Arts Teachers in Kansas.* M.S. in Ed., Kansas State Teachers College, 1942. 66 p.

A description of the financial record system and methods used in financing industrial arts supplies in Kansas high schools.

114. EDMUNDS, SAMUEL (M.S.). *A Comparative Study of the Actual Cost per Pupil-Hour of Teaching Industrial Arts and the Average Cost of Teaching All Other Subjects in the High Schools and Junior High Schools of Thirty-Nine Cities in the State of Missouri for the Year 1929–1930.* Iowa State College, 1932. 192 p.

A comparative study of costs for teaching industrial arts and all other subjects.

115. EMERSON, JAMES C. (M.S.). *Problems of Purchasing, Issuing and and Accounting Relating to Supplies Used in Industrial Arts Classes in Oklahoma.* Oklahoma A & M College, 1940. 86 p.

A survey of practices followed in purchasing, issuing, accounting and paying for supplies used in industrial arts shops, with suggestions for improvement.

116. GREGG, HARRY E. (M.S.). *Methods of Handling and Accounting for Supplies Used by Industrial Arts Teachers in Missouri.* Iowa State College, 1934. 54 p.

An investigation to determine the methods used by industrial arts teachers in sixty-three schools in Missouri for handling and accounting for industial arts supplies.

117. HOESSEL, SHELDON W. (M.A.). *Hourly Costs of Subjects Taught in Industrial Arts Departments in San Jose, Stockton, and Bakersfield for year 1934–35.* Stamford University, 1936. 76 p.

The cost of industrial arts per pupil per subject is examined. Benefits to the student and to the school and variations among communities are noted.

118. LANGE, ERIC F. (M.S.). *Efficient Methods of Financial Accounting for Industrial Arts Departments—A Study for the Development of Efficient Methods of Handling the Fees and Deposits of Industrial Arts Departments of Two and Three Men.* The Stout Institute, 1939. 46 p.

A study of the handling of supplies and equipment in industrial arts departments, based on a survey of ninety industrial arts teachers in Illinois, Wisconsin, Minnesota, and Iowa. Methods for setting up a plan for efficient fee and deposit handlings are recommended.

119. LEAVITT, WILLIAM C. *A Study of Budgeting of Industrial Arts in Tennessee Schools.* M.A., 1952, Middle Tennessee State College. 39 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the status of budgeting in industrial arts shops, and to make recommendations for improving budget practices.

Source of Data: Data were secured through questionnaires and visitations to industrial arts shops of Middle Tennessee. A study of the literature was made, together with suggestions from industrial arts teachers, in an effort to arrive at the most practical form of budgeting.

Findings and Conclusions: There is a wide variety of fees charged students for participation in industrial arts courses. Most industrial arts departments operate with little, if any, system of budgeting. Industral arts teachers show a lack of knowledge of basic principles of budgeting, and are lax in keeping accurate, up-to-date records. Most industrial arts teachers collect or handle money paid by students.

120. **MAKEPEACE, FRANK G. (M.A.).** *The Instructional Costs of Vocational Subjects in the Senior High Schools of Los Angeles.* University of Southern California, 1931. 92 p.

An investigation of actual per pupil cost in terms of the nature of the vocational subject.

121. **MATTHEWS, EMERSON EDWARD.** *Handling Consumable Materials in the Industrial Arts Shop.* M.Ed., 1952, Colorado Agricultural and Mechanical College. 94 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To formulate an effective and efficient method of handling consumable materials used by industrial arts students.

Source of Data: Data were obtained from a review of literature and from questionnaires sent to 118 Missouri industrial arts teachers.

Findings and Conclusions: With 75 per cent of the industrial arts teachers collecting money from students for consumable materials, an accurate and economical method is essential. Exact records of materials issued, amounts determined from money collected, fixed prearranged charges for consumable materials, and definite methods of collecting shop bills are practices which should be followed.

122. **McCLINTOCK, WAYNE B. (M.S.).** *A Cost Analysis of Industrial Arts Education in Junior High School Classes of the Upper Peninsula of Michigan From Sept. 1, 1930 to Sept. 1, 1933.* Iowa State College, 1936. 47 p.

An examination of the pupil hour cost of industrial arts education in junior high schools of the Upper Peninsula of Michigan for the years 1930–31, 1931–32, 1932–33 to discover the increase or decrease in this cost and to determine the cause of the fluctuation.

123. **MUDRAK, F. G. (M.S.).** *The Cost Per Pupil-Hour of Teaching Industrial Arts in Oklahoma High Schools—A Comparison of the Costs of Industrial Arts and Other High School Subjects in Forty Selected High Schools in the State of Oklahoma for the Year 1937–1938, and a Comparison with a Previous Study made in 1927–1928.* The Stout Institute, 1941. 154 p.

A statistical study of forty Oklahoma high schools to compare the cost per pupil-hour of instruction in industrial arts with other high school subjects. The population trends in eleven Oklahoma cities and the construction of schools with Federal assistance during the ten year period are considered.

124. **NORTON, JOHN M. (M.S.).** *A Comparative Study of Finance Methods Used by Industrial Arts Teachers of Illinois.* Iowa State College, 1933. 49 p.

A comparison of finance methods in various schools in Illinois. Information on such topics as the following is given: who buys the supplies and materials, cost to pupils, caring for waste material, materials furnished to other departments, when supplies are purchased, and purchases by bids.

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125. **PARKES, GEORGE H. (Ed.D.).** *The Comparative Cost of Vocational Industrial Education in Certain Second-Class School Districts in Pennsylvania.* Pennsylvania State College, 1939. 130 p.

A study to compare the contributions of the Commonwealth and the local second-class districts toward the support of local programs of vocational industrial education in an effort to validate a system of accounting which shows net total operating cost.

126. **REESE, ROBERT M. (M.S.).** *An Analysis of Vocational Shop Training Costs.* Purdue University, 1945. 31 p.

A survey of seventy vocational shops in Indiana to determine the operating costs for vocational training in machine shop, electric arc, and oxy acetylene welding. Norms are established for total costs and for costs in component areas.

127. **RUSH, HENRY FRANK (M.S.).** *A Study of Unit Cost of State Operated Trade Schools in Louisiana.* Louisiana State University and A & M College, 1948. 57 p.

A study of the cost per student hour of instruction in the various state operated trade schools in Louisiana. The study was limited to a breakdown of the cost per student hour for each department in each of the state operated trade schools in full operation in Louisiana for the fiscal year of 1946 to 1947.

128. **SCHELL, HENRY T. (M.S.).** *Comparative Cost of Teaching Industrial Arts in Iowa.* Iowa State College, 1931. 184 p.

An analysis of annual reports of the state superintendent's office for the school year 1929–1930 to determine the cost of teaching industrial arts as compared with the average cost of teaching all other subjects.

129. **SCHRAMM, HOWARD R.** *Industrial Arts Financial Procedures in the County and Exempted Village Schools of Ohio.* M.A., 1949, Ohio State University. 107 p. Education Library, Ohio State University, Columbus.

Purpose: To determine current practice concerning financial procedures in industrial arts in the county and exempted village schools of Ohio and to analyze and interpret the findings and make recommendations.

Source of Data: Questionnaires were sent to 310 county and exempted village schools. A 58 percent return was received.

Findings and Conclusions: Significant conclusions reached were: Each industrial arts department set up a yearly budget; funds for industrial arts be allocated by the lump sum method; items included in a laboratory fee be carefully and thoroughly formulated; industrial arts teachers should not collect and account for money received from students; teachers be held accountable for all supplies; an efficient and effective financial record system be adopted; provisions be made for indigent students; provisions be made for the replacement of obsolescent machinery; equipment and supplies be purchased locally; cooperative purchasing in county systems be initiated and that competitive bids be required.

130. **SMITH, GERARD S.** *The Development and Description of a Recommended Procedure for Keeping Inventories of Supplies and Equipment in School Shops.* M.Ed., 1952, Wayne University. 47 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To develop a procedure based on standard accounting procedures which are adaptable to school shop programs in controlling, directing, and regulating supplies and equipment.

Source of Data: Data were obtained from supervisors, administrators, and teachers.

Findings and Conclusions: A procedure resulted, based on standard accounting procedures, that is adaptable to school shop programs in controlling, directing, and regulating supplies and equipment.

131. **STEPHAN, JAMES O. (Masters).** *Industrial Arts Supply Costs and Records in Eight Franklin County Ohio Schools.* Ohio State University, 1936.

132. **TRESLER, HAROLD CARL (M.S.).** *Methods of Shop Finance Used by Industrial Arts Instructors of Oregon.* Oregon State College, 1942. 74 p.

A study of the problems with recommendations for a satisfactory method of purchasing, issuing materials, collecting money, and keeping records of transactions in the industrial arts shop.

133. **WARD, WILLIAM L. (Masters).** *A Comparative Study of the Cost of Teaching Industrial Arts as Compared with Other Laboratory Subjects in the Robert E. Lee High School of Goose Creek Over a Three-Year Period.* A & M College of Texas, 1939.

134. **WELLS, NATHAN W. (M.S.).** *A Study of the Costs of Industrial Arts Education in the Junior High Schools of Los Angeles.* University of Southern California, 1934. 109 p.

A study of the cost of industrial arts education in the Los Angeles District from 1930–1932, including all financial aspects. The study is broken down into specific types of shops and given in terms of pupil-hours.

135. **WHITMORE, NORVIN T. (M.S. in Ed.).** *A Study of the Methods for Financing Project Materials in the Industrial Arts Courses on the Junior High School Level.* Cornell University, 1947. 130 p.

A study of the historical background and present practices in methods of financing work projects in industrial arts shops on the junior sigh school level. The survey is confined to programs being carried on in New York, New Jersey, and Pennsylvania and covers the period 1870 to the present.

136. WILKEY, CARTER HAROLD. ***Survey Study of Shop Finances in Illinois.*** **M.S., 1951, Illinois State Normal University. 117 p. Library, Illinois State Normal University, Normal.**

Purpose: To find the various methods of shop finances.

Source of Data: Data were obtained from personal experience, reading of articles, books and related studies, and a questionnaire sent to 239 industrial-arts teachers in the state of Illinois.

Findings and Conclusions: The methods of shop finance were examined and compared with what leaders in the field of industrial arts believe to be desirable methods. Many of the methods reported in use were the same as those put forth by leaders in the field of industrial arts.

Education in Higher Institutions

137. ALBRECHT, HENRY (M.A.). ***An Analysis of the Preparation of Industrial Arts Teachers of Colorado State College of Education, 1934–1940.*** **Colorado State College of Education, 1941. 137 p.**

An analysis of the professional preparation of A. B. graduates with a major in industrial arts from Colorado State College of Education 1934–1940, and an evaluation of the course work by the graduates.

138. APPEL, SAM DARLING. ***Industrial Education in Some of the Colleges of Nebraska.*** **M.S., 1949, Iowa State College. 56 p. Library, Iowa State College, Ames.**

Purpose: None reported.

Source of Data: Data were secured by means of check sheets, personal interviews, college catalogues and from all colleges offering work in industrial education in Nebraska during 1948–49.

Findings and Conclusions: The findings in the study indicate a greater need for uniformity in: Course offerings, credit offerings, and major and minor requirements in industrial education.

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139. BAAB, CLARENCE T. ***Analysis, Development and Organization of a Program for the Preparation of Industrial Arts Teachers at Colorado State College of Education.*** **Ed.D., 1950, Pennsylvania State College. 128 p. Library, Pennsylvania State College, State College.**

Purpose: To bring together data, gathered over a three-year period, with a view of improving the program for the preparation of industrial arts teachers at Colorado State College of Education. Types of positions available, demands of school districts and qualifications and positions of former students were investigated.

Source of Data: Data were obtained from the State Superintendent of Public Instruction office; industrial arts teachers of Colorado; school administrators; high school transcripts of Colorado State College of Education graduates in industrial arts during the period, 1939–48, and personal interview with teachers, supervisors and school administrators.

Findings and Conclusions: Industrial arts in Colorado is becoming more "generalized" in the public schools. School administrators of Colorado desire to make the following changes: Increase areas of work taught, and admit girls to industrial arts classes. School administrators not offering industrial arts in their schools plan to organize and put into service a general type of shop when facilities are available. The 72 quarter hours of industrial arts is not sufficient to meet the needs of the industrial arts teacher in Colorado today. The first major improvement needed is more room, a plan to replace obsolete equipment in all areas of work.

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140. BERGENGREN, ROY F., *Jr.* ***Some Components of Current Leadership in Industrial Arts Teacher Education.*** **Ed.D., 1953, University of Florida. 162 p. Library, University of Florida, Gainesville.**

Purpose: To make an initial investigation of certain phases of leadership in industrial arts teacher education.

Source of Data: Data were secured from books and other studies, questionnaires, letters from leaders, identification of leaders by the profession, study of leaders through biographical data, and ideas contained in writings.

Findings and Conclusions: A need exists for research and for testing the general education concept of industrial arts. The successful communication of ideas sets the leader apart from the average industrial arts teacher educator. There is a definite need for leaders who will be closely identified with the group in terms of objectives and recognition. Experience is an important component of leadership in industrial arts teacher education.

141. **BIBB, LEON (M.A.).** *Industrial Education in Tennessee Colleges.* Iowa State College, 1947. 47 p.

A review and analysis of the industrial education teacher education program in the colleges of Tennessee.

142. **BROPHY, JOHN M.** *Industrial Graduates of The Stout Institute.* M.A., University of Minnesota, 1941. 173 p.

A canvass of personal, preparational, and experience phases in the lives of selected graduates for the purpose of discovering a core of success factors worthy of consideration by individuals and by the institution.

143. **BROWN, CHESTER R.** *Industrial Arts Teacher Education Curriculums.* M.S., 1951, Stout State College. 70 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To make a comparative survey of requirements of various institutions engaged in the training of industrial arts teachers in the United States.

Source of Data: Data were obtained from a documentary analysis of the catalogs of 109 schools.

Findings and Conclusions: The requirements in the various courses showed wide variation in semester hour range. Standards and criteria need to be developed to serve industrial arts teacher education curriculum revision.

144. **BUNN, PAUL CLAY.** *Industrial Arts Education in Non-Tax Supported Colleges.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 42 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purposes: To determine the need for industrial arts courses in non-tax supported colleges.

Source of Data: College catalogs were reviewed to determine the extent of industrial arts offerings. A questionnaire was used to determine the interest of the students.

Findings and Conclusions: Industrial arts could be included in the non-tax supported college, thereby satisfying a need of students in these institutions.

145. **BURGETT, RAYMOND W. (M.S.).** *Salient Factors Pertaining to Graduate Work in Industrial Arts Education and Vocational Industrial Education.* Iowa State College, 1933. 140 p.

A survey of all institutions in the United States that had granted two or more graduate degrees to candidates having at least "thesis credit" in industrial education in 1934–1935 to discover the major elements of graduate work in the field.

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146. **CALLAN, LOUIS J.** *Industrial Arts Teacher Education Programs: A Comparative Analysis and Evaluation of Selected Teachers and Colleges.* Ph.D., 1952, The Ohio State University. 253 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain how teachers were prepared for the teaching profession, what, and how well they are now teaching in the public schools.

Source of Data: Data were secured from published curricula and a questionnaire sent to selected leaders on a nationwide basis.

Findings and Conclusions: There is a very considerable lag between theory and practice. Entrance requirements are too low, there are wide variations in requirements for the major and minor. Student teaching situation should be made more real and more emphasis should be placed on the elementary and adult education phases of the program. The teacher's college curricula should be broadened to more accurately orient teachers to technology while they are in preparation.

147. **CALLENDAR, L. H. (M.A.).** *The Professional Preparation of Industrial Education Teachers from Iowa State Teachers College.* Colorado State College of Education, 1932. 75 p.

An evaluation of the present offerings of the industrial arts department by its graduates in terms of on-the-job needs.

148. **CAMERON, DONALD C. (M.S.).** *A Plan for Training Trade and Industrial Teachers in Nevada.* Colorado Agricultural & Mechanical College, 1940. 122 p.

A study of the organization and plan of training needed for trade and industrial teachers in Nevada. Recommendations for improvement are offered.

149. **CHAVOUS, ARTHUR M.** (Masters). *A Study of Vocational Education at Wilberforce University.* Ohio State University, 1932.

150 **CHRISTIANSON, PETER F.** (M.S.). *A Survey of Selected English Units for Industrial Education Instructors in Colleges and Universities.* The Stout Institute, 1947. 40 p.

A survey of the status of related English courses for industrial education students in ninety-seven colleges and universities, including the opinions of English teachers concerning their courses. Consideration is given to the adequacies of English courses in college industrial education curricula.

151. **COLE, DUANE R.** (M.S.). *Industrial Education in Some Colleges of Missouri.* Iowa State College, 1948. 34 p.

An examination of the existing programs in the industrial education departments in six colleges in Missouri.

152. **COLLINS, SAMUEL R.** *A Study of the Objectives of the Division of Industrial Education at Prairie View Agricultural and Mechanical College.* M.S., 1953, Prairie View Agricultural and Mechanical College. 55 p. Library, Prairie View Agricultural and Mechanical College, Prairie View, Texas.

Purpose: To examine the objectives of the division of industrial education and to make recommendations in the light of results of the study.

Source of Data: Data were secured through references, bulletins, student personnel cards, and interviews.

Findings and Conclusions: Most of the objectives of the industrial education division were desirable as goals for the division; some were not desirable because they did not apply to industrial education. Others were undesirable because their phraseology failed to convey a clear and definite meaning.

153. **CONRAD, WARREN D.** (M.Ed.). *College Training for Vocational Teachers in the Rocky Mountain Area.* Colorado Agricultural & Mechanical College, 1948. 64 p.

A survey of the opportunities in both graduate and undergraduate work that are offered to teachers of vocational education in the Rocky Mountain area.

154. **COON, EUGENE B.** (M.A.). *The Professional Preparation of Iowa State College Graduates in Industrial Arts 1932–1939.* Colorado State College of Education, 1941. 98 p.

A survey of the professional preparation of Iowa State Teachers College graduates in industrial arts, 1932–1939, and an evaluation of the work taken by the graduates.

155. **COSTANTINI, DOMINIC ENRICO.** *The Manitoba Training Program for T & I Teachers Compared with Other Provinces and States.* M.Ed., 1951, Colorado Agricultural and Mechanical College, 440 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain whether the present teacher training program, organization, and curriculum in Manitoba are adequate, and if not, what has to be done so that more competent trade and industrial teachers may be trained.

Source of Data: Data were obtained by a review of bulletins, reports, state and provincial plans, by correspondence, and by personal interviews.

Findings and Conclusions: The Manitoba program lacked teacher trainers and an inspector of technical education. It made no use of conference and workshop methods, observation and practice teaching, and special evaluations. The following methods should be included: research, periodical return to industry, use of correspondence courses, and use of visual aids. A more definite teacher-training program for trade and industrial teachers is required in Manitoba.

◆ 156. **COTTON, GEORGE R.** (Doctors). *Collegiate Technical Education for Negroes in Missouri with Proposed Plans for Development.* Ohio State University, 1944.

157. **CUNNINGHAM, THOMAS V.** (M.A.). *Industrial Education in Universities and Colleges.* University of Minnesota, 1933. 247 p.

A survey of current curricular practices in the preparation of industrial arts teachers. Through a study of college catalogs and instructor responses to questionnaires, this study presents comparative data on the uniformity in the preparatory offerings and requirements for this special field of teaching.

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158. **DECKER, GEORGE CLARKE** (Ph. D.). *An Industrial Arts Master's Degree Program: with Particular Reference to the State of New York.* Ohio State University, 1943. 258 p.

An investigation of the facilities for training industrial arts majors on the master's degree level. It proposes a program for New York State, including administrative problems, objectives, faculty requirements and responsibilities, and selection and admission.

159. **DODGE, JAMES CHARLES.** *An Analysis of the Preparation of Industrial Arts Graduates of the Colorado Agricultural and Mechanical College, 1938 to 1951.* M.A., 1953, Colorado State College of Education. 160 p. *Library, Colorado State College* of Education, Greeley.

Purpose: To make a detailed analysis of the formal high school and college preparation of the industrial arts majors graduated from a four year industrial arts curriculum at the Colorado Agriculture and Mechanical College, 1938 through 1951.

Source of Data: Data were obtained from 59 industrial arts graduates, and from an analysis of 14 catalogs.

Findings and Conclusions: Student teaching was probably the most valuable course offered. Majors should be encouraged to participate in extra-curricular activities. Science and social studies rank high as subject combinations. One-third of the group studied had left teaching. Auto mechanics and driver training are two new courses needed most.

160. **EDMUNDS, WILLIAM S.** (Masters). *A Comparative Study of the Vocational Offerings of the South-Land Grant Colleges.* Virginia State College, 1942.

161. **ENDERBY, DAVID RILEY.** *A Study of Industrial Arts Programs of the Teacher Training Institutions of Oklahoma to Determine if the Teachers of Industrial Arts in the High Schools of Oklahoma are Receiving Adequate Training.* M.S., 1950, North Texas State College. 82 p. Library, North Texas State College, Denton.

Purpose: To determine whether the training of teachers of industrial arts in Oklahoma is adequate and whether the training is utilized by the teachers to meet the apparent needs and trends in the field of industrial arts.

Source of Data: Pertinent literature was examined to ascertain trends in industrial arts. Catalogs were analyzed to determine offerings of the industrial arts departments in the institutions of higher learning in Oklahoma. A questionnaire was used to secure information concerning the work taken in the field of industrial arts by the teachers of Oklahoma.

Findings and Conclusions: A high percentage of teachers of industrial arts in Oklahoma indicated that they had received inadequate or no college training in many teaching problems commonly encountered in teaching industrial arts. Inadequate preparation had been received in shop accounting, use of visual aids, techniques of assisting students in formulating life objectives and choosing a course of study, in metal working, in hand tool processes, and in the history and philosophy of industrial arts.

162. **ENGELBART, LEON PRANGE.** *Pre-Service Orientation of the Industrial Arts Teacher Training Program.* M.Ed., 1951, Colorado Agricultural and Mechanical College. 70 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To learn what changes, if any, should be made in the pre-service orientation of industrial arts teachers at the University of Nebraska in order that the departmental objectives may be fulfilled more adequately.

Source of Data: Data were obtained from questionnaires sent to Bachelor's degree industrial arts graduates of the University of Nebraska. Responses were tabulated to determine areas where industrial arts teachers were having their greatest difficulties.

Findings and Conclusions: A program of recruiting, screening and follow-up, including supervision is deemed advisable. Greater emphasis should be placed on the following areas of the industrial arts teacher education program: determining course of study content; shop organization, shop organization, evaluation of instruction; collecting and writing instructional materials; organizing special classes; ordering equipment, materials and supplies; operating on a prescribed budget; teaching methods; and developing personally and professionally.

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163. **FAGAN, RAYMOND, E. B.** *College Preparation for Teachinfg Manipulative Activities in the Elementary School.* Ed.D., 1954, Oregon State

College. 124 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the nature and extent of the preparation in manipulative activities offered by elementary teacher education institutions.

Source of Data: Data were secured by a questionnaire sent to heads of selected elementary education departments in the United States.

Findings and Conclusions: Practices concerning time spent, credit, requirements, courses designed for elementary teachers, and textbooks seem to be generally adequate. Possibilities of relationships made with elementary school subjects and the variety of experience areas used in courses seem to be entirely inadequate. The majority of courses are divided about equally between education and art departments. Industrial arts and home economics departments are responsible for relatively few courses. Two courses are recommended; one for familiarization with tools and materials and the other for methods of use.

164. FARMER, JOE HAROLD. ***To Determine Whether the College of Texas is Preparing Their Students of Industrial Arts to Teach Effectively in the High Schools of Texas.*** **M.S., North Texas State College, 1939. 79 p.**

A descriptive study of the college training of industrial arts teachers of North Texas State College teaching in the high schools of Texas.

165. FARNAN, LINDSAY G. (M.S.). ***Graduate Offerings in Industrial Education.*** **Iowa State College, 1948. 74 p.**

A review of the offerings of colleges and universities in the United States to determine the uniformity of offerings in the industrial arts program.

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166. FEIRER, JOHN LOUIS (Ed.D). ***Research Leading to Advanced Degrees in Industrial Arts in Thirty-Three Colleges and Universities.*** **University of Oklahoma, 1946. Published: Western Michigan College, 1947. 295 p.**

An investigation of the status of research in graduate programs in industrial arts education in thirty-three colleges and universities for the year 1946. A practical graduate course of study for research is organized.

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167. FRANKSON, CARL EDWARD. ***Industrial Arts Teacher Education in Maine.*** **Ph.D., 1948, Ohio State University. 288 p. Library, Ohio State University, Columbus.**

Purpose: To study the program of industrial arts teacher education in Maine with a view toward extending and reorganizing the program at the Teachers College to meet the needs of the youth of Maine.

Source of Data: Visits were made to many schools to gain first hand information concerning what was being taught in industrial arts. The space and facilities available, the methods used, and other information of a general nature concerning industrial arts were secured through conference with instructors and administrators.

Findings and Conclusions: The direction of education lies within ideas of American culture. The need for industrial arts, or rather "manual training" was recognized by legislation in 1911. The 6 shop areas of the college program, namely: wood, metal, graphic arts, auto mechanics, electricity and drawing were found to be below standard in health aspects, sanitation, storage space, library facilities, location and records. The students at Gorham, Maine are selected on only one basis, academic achievement. Music, fine arts and literature are not included in the cultural experiences of industrial arts majors at Gorham. There is no organized program of counseling and guidance available to the students at Gorham. Student teaching facilities are selected by the State department. The improvement training of teachers in Maine is limited to summer school every other year. The study of the industries and occupations of Maine reveals the State to be predominantly agricultural in character, but industrial in nature. Arts and crafts have been practiced by the people of Maine since colonial times and comprise a major industry. The schools of Maine in which industrial arts are taught are predominantly small, 55 percent having an enrollment of 350 or less.

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168. FRANKSON, CARL EDWARD (Ph.D.). ***Industrial Arts Teacher Education in Maine—Analysis and Projection of Program.*** **The Ohio State University, 1948. 297 p.**

A set of criteria which could be applied to teacher education programs was developed. The program at the State Teachers College at Gorham, Maine was then analyzed in the light of these criteria in an effort to make recommendations for the improvement of the program.

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169. GALLINGTON, RALPH O. (Ed.D.). *Teacher Education in Industrial Arts with Special Emphasis on Evaluative Criteria.* George Washington University, 1947. 199 p.

The appraisal of objectives, professional education, organization, and methodology of programs of teacher education by fifty-two specialists and a check-list study of twenty outstanding teacher education programs.

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170. GIACHINO, JOSEPH W. *An Analysis of the Success Qualities That Should be Emphasized in the Training of Candidates To Become Competent Teachers of Industrial Arts.* Ed.D., 1949, The Pennsylvania State College. 205 p. Library, Pennsylvania State College, State College.

Purpose: To identify the essential qualities which teachers of industrial arts need for success in teaching and determine whether any relationship exists between the educative experiences provided by institutions of teacher education for preparing teachers of industrial arts and the qualities considered by supervisors of industrial arts as contributing to success in teaching industrial arts.

Source of Data: A questionnaire was mailed to 500 supervisors of industrial arts located in communities having a population of 15,000 or more in each of the 48 States. The questionnaire included a list of success factors which respondents were requested to indicate their opinions as to whether or not the items were very important or not very important for teachers of industrial arts. A second questionnaire was mailed to 225 teacher education institutions. The second questionnaire requested data to indicate the degree of emphasis assigned to each of the success factors in the undergraduate training of industrial arts teachers.

Findings and Conclusions: Supervisors of industrial arts and teacher educators are not in agreement as to what contributes to success in teaching industrial arts. A need exists for a closer bond of understanding between teacher educators and supervisors if there is to be better trained teachers of industrial arts. A need also exists for accreditation of industrial arts teacher education.

171. GOFF, PERCY MARTIN. *A Study of Why Students Change Their Major.* M.Ed., 1953, Agricultural and Mechanical College of Texas. 69 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To find reasons substantiating the student's choice of his first major, and to show reasons why students changed majors.

Source of Data: Data were obtained from books and an unpublished survey of 625 students entering the School of Engineering at Texas Agricultural and Mechanical College in September 1947.

Findings and Conclusions: Approximately one-third of the students at Texas Agricultural and Mechanical College changed majors. Sixty-eight per cent chose their first major because they thought they would like the work or because they were undecided. The student's interest and job opportunities should be related to his choice of a major. The largest majority of students changing majors do so under satisfactory grade conditions. Scholastic success tends to accompany students who have changed majors.

172. HALL, CLYDE WOODROW. *Undergraduate Offerings in Industrial Education in Negro Land-Grant Colleges.* M.S., 1949, Iowa State College. 76 p. Library, Iowa State College, Ames.

Purpose: To examine and compare the required undergraduate offerings in industrial education in Negro Land-Grant colleges during the school year 1948–49.

Source of Data: Data were secured from proceedings, books, college catalogues, bulletins, and questionnaires.

Findings and Conclusions: There was a wide diversity in the titles of courses and the number of courses offered in the various industrial education curricula. The minimum number of semester hours of credit required for a Bachelor's degree ranged from one hundred twenty-four to one hundred fifty-eight and seven-tenths, and the mean was one hundred thirty-six and seven-tenths semester hours. Credit offered for courses in shop practice ranged from twenty to forty-two semester hours, and the mean was twenty-nine and one-tenth semester hours.

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173. HANKAMMER, OTTO ALFRED (Ph.D.). *Graduate Programs in Industrial Arts Education with Special Reference to the Master's Degree.* Ohio State University, 1936. 187 p.

An investigation of institutions in the United States offering major graduate work in industrial arts education leading to master's degrees during the years 1935–1936, in an effort to determine the status of graduate programs in industrial arts.

174. HANSON, HANS M. *Shop and Laboratory Woodwork in the Preparation of Wisconsin's Industrial Teachers.* M.A., University of Minnesota, 1936. 152 p.

A questionnaire study of industrial arts programs, procedures, and problems in Wisconsin public schools, as a basis for revising the teacher-training curriculum.

175. HENCK, GEORGE DANIEL (M.A.). *Present Status of the Training of Industrial Arts Teachers in the United States.* University of Southern California, 1931.

An inventory of the number of men and women trained to teach industrial arts, and an analysis of the teacher training curricula with special reference to skills required and methods of instruction.

176. HOGAN, ROBERT DALE. *A Critical Analysis of a Student Teacher Training Program.* M.Ed., 1951, Colorado Agricultural and Mechanical College. 54 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine how the industrial arts student teaching program at Kansas State Teachers College, Emporia, could be improved.

Source of Data: Data were obtained from questionnaires sent to 35 recent graduates of the college.

Findings and Conclusions: Major problems encountered by beginning industrial arts teachers were: planning the instructional program, grading, discipline, obtaining materials and equipment, presenting informational material, operating on a budget, making and keeping records, and using visual aids.

177. HOLMEN, HOLGER E. *A Suggested Outline for Industrial Arts at Waldorf College.* M.A., 1949, University of Minnesota. 84 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To fulfill need for industrial arts at Waldorf College.

Source of Data: A survey of offerings and activities in 41 mid-western junior colleges.

Findings and Conclusions: Explains how each industrial arts area or subject matter field may be expanded to good effect. The machine woodworking area has been developed in detail.

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178. HUNT, DeWITT TALMADGE (Ph.D.). *Shopwork in Engineering Divisions of State Universities and Land Grant Colleges.* Ohio State University, 1939. 411 p.

An investigation of shopwork instruction including courses offered for non-engineering as well as engineering students from 1824–1939. Proposals for changes and additions to their curricula are included.

179. HUTCHCROFT, CECIL R. (M.A.). *An Analysis of the Preparation of Industrial Arts Teachers.* Colorado State College of Education, 1934. 120 p.

An evaluation of the professional preparation of one hundred graduates of a teachers college, including a study of extra-curricular activities.

180. JETER, JAMES E. *Requirements for a Baccalaureate Degree with a Major in Industrial Arts in Seven Institutions of Higher Learning in Texas From 1920–1953.* M.S., 1954, *North Texas State College.* 97 p. Library, North Texas State College, Denton.

Purpose: To analyze the requirements for a major or first minor in industrial arts in seven teacher education institutions in Texas.

Source of Data: Data were secured from the annual catalogs and bulletins published by the seven colleges.

Findings and Conclusions: The number of hours required for a major in industrial arts in each of the seven colleges exceed considerably the minimum number of hours required for certification purposes by the Texas Education Agency.

181. JOHNSON, IRA H. (M.S.). *Industrial Education in Minnesota State Teachers College.* Iowa State College, 1940. 53 p.

A study of the faculty and curriculum of the industrial education program in Minnesota state teachers colleges.

182. **KARNES, M. RAY (M.S.).** *Adequacy of Training of Junior High School Teachers of Industrial Arts in Texas.* North Texas State College, 1938. 68 p.

A survey of course offerings in teacher training institutions, checked against courses taught in junior high schools, with recommendations for improvements in teacher training programs in Texas.

183. **KELLER, ADRIAN D. (Masters).** *An Evaluation of the Adequacy of the Teacher-Training Courses Offered by the State of California by Means of the Opinions of Beginning Industrial Arts Teachers and Their Principals.* University of Southern California, 1932.

184. **KIBLER, GEORGE WARNER (Masters).** *Training of Industrial Education Teachers in Texas.* Southern Methodist University, 1931.

185. **KINDRED, ROY M. (M.A.).** *Industrial Education at Colorado State Teachers College: An Evaluation of the Course of Study.* Colorado State College of Education, 1931. 131 p.

An investigation to evaluate an industrial arts program through an analysis of college catalogs and interview of teachers and supervisors.

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186. **KOHLER, RODERICK GEORGE.** *Status and Trends in Graduate Industrial Teacher Education in the United States.* Ed.D., 1952, University of Missouri. 280 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain the current status and trends in graduate programs in industrial teacher education in the United States, including the education of teachers of industrial arts, vocational-industrial education, and technical education.

Source of Data: Data were obtained from information blanks completed and returned by chairmen of departments of industrial education, or their representatives, of sixty-six institutions offering graduate work in industrial teacher education and from college and university catalogs and other written material furnished by participants in this study.

Findings and Conclusions: In recent years the greatest growth in graduate programs in industrial teacher education has been in the industrial arts phase. There is a great increase in the number of graduate students majoring in industrial arts and a decrease in the number majoring in vocational-industrial education. The number of graduate degrees granted in industrial teacher education has greatly increased during the last decade. There is little consistency regarding the entrance requirements for graduate study in industrial teacher education. Many institutions allow undergraduate credit for trade experience in meeting entrance requirements for students majoring in vocational-industrial education. There is a lack of uniformity in graduate credit requirements in industrial teacher education. The minimum number of hours required for the Master's Degree in industrial education is increasing. Fewer institutions are now requiring a Master's thesis in industrial teacher education; additional course work is becoming a common substitute for the thesis. A majority of the institutions giving graduate work in industrial education allow graduate credit for shop courses to apply toward the Master's degree. There is little uniformity regarding the minimum residence requirements for the Doctor's degree with a major in industrial education. There is as wide a variation of courses and practices regarding graduate programs in industrial teacher education among institutions offering the same phase of industrial education. The majority of the staff members teaching graduate courses in industrial teacher education do not have an earned Doctor's degree.

187. **KOSCHLER, THEODORE A. (M.S.).** *Determining Course Content in Electronics for Teachers Colleges.* Iowa State College, 1947, 57 p.

A study to determine the extent of electronics offerings and future plans in the teacher education colleges of the United States. Electronics manufacturers were surveyed on their opinions regarding training desirable for maintenance and service of products and on their training facilities and practices.

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188. **KURTH, EDWIN L.** *Certain Developments and Trends in Industrial Arts Teacher Education.* Ed.D., 1955, University of Florida. 241 p. Library, University of Florida, Gainesville.

Purpose: To ascertain what practices and methods are considered the most effective in present day industrial arts teacher preparation and what trends educators feel will have future influence.

Source of Data: Data were obtained through a questionnaire which was sent to heads of departments and leading industrial arts educators.

Findings and Conclusions: Increased enrollments in industrial arts in secondary schools have resulted in a greater demand for more adequately trained teachers. More effective recruitment practices must be utilized to bring qualified personnel into the profession. Facilities for preparing industrial arts teachers need attention. Various trends in philosophy and practice have been evident for some time and are still not established procedures.

189. LARSON, RAYMOND H. *Success Patterns in Industrial Education.* Ph.D., 1951, University of Minnesota. 299 p. Library, University of Minnesota, Minneapolis.

Purpose: To gather, organize, and present data pertinent to questions concerning graduates of the Industrial Education Department, University of Minnesota.

Source of Data: Data were obtained from college transcripts of credits, recommendations, test scores, admission records, and a questionnaire.

Findings and Conclusions: First degree graduates were weakest in academic areas, especially mathematics and science. Students native to the University are weaker than those who transferred into the College of Education. Those graduating with distinction are predominantly transfer students. The undergraduate records of those with first degrees other than in the College of Education compare favorably with the undergraduate records of those of the first degree recipients who later attained the second degree.

190. LASH, HARRY EVANS. *Graduates of the Division of Engineering and Industrial Education of the Tennessee Agricultural and Industrial College, 1930–1947.* M.S., 1948, Tennessee Agricultural and Industrial State College. 49 p. Library, Tennessee Agricultural and Industrial State College, Nashville.

Purpose: To ascertain the effectiveness of the industrial education program at the Tennessee Agricultural and Industrial College from 1930 to 1947.

Source of Data: Data were obtained by means of questionnaires.

Findings and Conclusions: The Industrial Education Department of the Tennessee Agricultural and Industrial College has done a satisfactory job in preparing students for employment and for citizenship.

191. LATHROP, IRVIN J. (M.S.). *Policies in the Program of Industrial Arts Education Which Apply to Practice Teaching in Illinois, Iowa, and Wisconsin.* Iowa State College, 1938. 61 p.

A survey of eleven colleges in Illinois, Iowa, and Wisconsin that offer training for industrial arts teachers to determine the content and techniques of the practice teaching courses.

192. LUNDGREN, VERNON L. *Teacher Training Data.* M.A., 1951, University of Minnesota. 58 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To describe selected aspects of the Department of Industrial Education in the University of Minnesota over the period 1945–1950.

Source of Data: Data were obtained from a documentary study of University records, tabulated records of the course offerings, teaching personnel, student enrollment, and grade distributions of the entire industrial education department for a period of five years.

Findings and Conclusions: Similar studies should be made at intervals in the future.

193. LYON, WAYNE (M.A.). *The Professional Preparation of Industrial Arts Graduates of Kansas State Teachers College, 1930–1940.* Colorado State College of Education, 1942. 81 p.

A study to evaluate the professional preparation of industrial arts graduates of Kansas State Teachers College, 1930–1940.

194. MAYS, JESSE (M.A.). *The Development of Industrial Arts in the Colleges of Kentucky.* George Peabody College, 1933. 91 p.

A study of the development of industrial arts programs in the colleges of Kentucky. The programs were evaluated to ascertain the status of industrial arts teacher training colleges in the state.

195. McCLINTOCK, CALVIN H. (M.A.). ***Industrial Arts Education in State Teachers Colleges.*** **University of Minnesota, 1937. 152 p.**

A national survey of department offerings, requirements, purposes, services, and trends of four year industrial arts curriculums in state teachers colleges to determine the present characteristics of the four year programs for training industrial arts teachers.

196. McCRORIE, THOMAS R. (M.S.). ***Industrial Education in Illinois Colleges.*** **Iowa State College, 1947. 44 p.**

A survey to examine the existing programs in the industrial education departments of the colleges of Illinois.

197. McHENRY, PAUL T. (M.S.). ***A Comparative Study of Industrial Arts Education Programs in Forty-two Teachers' Colleges.*** **Oklahoma A & M College, 1933. 42 p.**

A comparative study of the teacher education program in industrial arts in forty-two institutions, with suggestions for their improvement.

198. McMAHON, EDWARD R. ***An Evaluation of Men Who Received the Master of Science Degree in Industrial Education from the Stout Institute 1935–1952.*** **M.S., 1952, Stout State College. 40 p. Library, Stout State College, Menomonie, Wisconsin.**

Purpose: To ascertain those areas in which Stout graduates show particular strengths or weaknesses, and to give the members of the instructional staff of Stout State College data with which to evaluate and improve their curriculum.

Source of Data: Data were obtained from a check list mailed to Stout graduates.

Findings and Conclusions: Generally, the employers considered graduates of the Stout State College with a Master of Science Degree above average teachers in the areas of industrial and vocational education. These graduates showed particular competence in the knowledges and skills of their subject matter specialties. They are also enjoying successful personal and professional relations with associates, students, and community. As a group, the graduates had few marked weaknesses in the areas covered by the check list. It was concluded that the graduate program of the Stout State College is operating in a highly successful manner.

199. MILES, GEORGE WILLIAM. ***The Preparation of Industrial Arts Teachers in the United States and Canada.*** **M.A., 1950, Colorado State College of Education. 193 p. Library, Colorado State College of Education, Greeley.**

Purpose: To examine the preparation of industrial arts instructors in the teacher education institutions of the United States of America and in Canada for such use as it may have in the changing, improving, or adjusting of Canadian programs to meet current needs.

Source of Data: Analysis of current catalogs of institutions offering industrial arts work, and by personal letters from leaders in the educational field of Canada.

Findings and Conclusions: Industrial arts advocates are obliged to take the initiative in showing administrators that their course area should be taken by all students, boys or girls, fast or slow learners. Teacher trainers must "sell" a sound background of psychology to their students by showing them the many reasons why it is a functional part of their preparation. The general shop, with its possibilities for the realization of the aims of general education, should be offered in the education of industrial arts instructors. The problem of evaluation is probably the weakest part of industrial arts instruction today, and the most worthy of research.

200. MILLER, PERCIVAL FORD (M.S.). ***A Study of Shop Courses Offered in Engineering Curriculums at Selected Land Grant Colleges, Polytechnic Institutes and Universities in the Eastern United States.*** **Cornell University, 1948. 98 p.**

A study of the shop work required in engineering curricula, the aims of shop work in college, and the plan of organization for conducting shop instruction.

201. MOORE, ROBERT J. ***Industrial Education Curricula in Minnesota State Teachers Colleges and at the State University.*** **M.A., University of Minnesota, 1948. 84 p.**

A study of the course offerings and degree requirements in industrial education in the Minnesota State Teachers Colleges and the University.

202. NAGEL, WILLIAM EDWARD (M.A.). ***A Program of Industrial Education for the Municipal University.*** **Municipal University of Wichita, 1948. 60 p.**

A survey of existing programs of industrial education in institutions of higher learning, together with an attempt to formulate a program patterned after the composite of these programs. The program devised is based upon present courses in state tax supported colleges and the municipal colleges of the United States.

203. NICHOLSON, GUY E. (M.S.). ***Present Status of Teacher Training Courses in Industrial Arts in Teacher Training Institutions Belonging to the American Association of Teachers Colleges.*** **Indiana State Teachers College, 1935. 60 p.**

Data has been secured from the colleges in which teacher training in industrial arts is offered regarding the academic, technical, and professional courses required, the time requirements, electives, and the trends in industrial arts education.

204. OPEM, MARTIN (M.S.). ***Teacher Training in Industrial Arts.*** **The Stout Institute, 1947. 52 p.**

An investigation of the graduation requirements and student expenses of industrial arts students in colleges in Illinois, Indiana, Ohio, Michigan, and Wisconsin. Initial salaries and salaries after ten years of teaching by graduates of these colleges are considered.

205. PEOPLES, EARL R. (M.S.). ***Graduate Work in Industrial Education at Iowa State College from 1928–1940.*** **Iowa State College, 1940. 79 p.**

An evaluation of the graduate work in industrial education at Iowa State College by 122 graduate students who have received Master's degrees from 1928–1940.

206. PETERSON, DENNIS R. ***Teacher training Data.*** **M.A., University of Minnesota, 1946. 62 p.**

Selected items concerning the Department of Industrial Education, University of Minnesota, both general and vocational phases, from fall quarter, 1935–36, to spring quarter, 1944–45.

207. PHILLIPS, HARRY A. (M.S.). ***A Critical Study and an Evaluation of Industrial Arts Teacher Training Institutions and Curricula.*** **Oregon State College, 1933. 48 p.**

A study which considers the status of industrial arts in higher education and the trends and tendencies in teacher training in industrial arts. The institutions are ranked in terms of semester hours of training offered.

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208. QUICK, OTHO JAMES. ***Teaching and Non-teaching Baccalaureate Degree Graduates With Industrial Arts Majors.*** **Ph.D., 1954, University of Minnesota. 249 p. Library, University of Minnesota, Minneapolis.**

Purpose: To ascertain whether any differences existed on thirteen items between the teaching and non-teaching baccalaureate graduates of Eastern Illinois State College with industrial arts majors.

Source of Data: Data were gathered from the records and mailed survey instruments for 258 graduates of Eastern Illinois State College.

Findings and Conclusions: No significant differences between the teaching and non-teaching groups existed on the canvass of thirteen items from the records. Significant differences were found on a number of items gathered from survey materials. Those believed to be pertinent were: singing or playing a musical instrument as a recreational activity, participation in social welfare groups, participation in service organizations, yearly salaries or incomes, leaving last industrial teaching position because of inadequate salary, and reactions on fifty-five opinion statements. Opinion statements seemed to offer promise of being a best predictor on future classification into teaching and non-teaching groups.

209. RARDIN, T. R. (M.A.). ***Industrial Arts Teacher Education of Fort Hays State College.*** **Colorado State College of Education, 1937. 85 p.**

A descriptive analysis of the A. B. graduates in industrial arts of Fort Hays College as regards their professional preparation and the requirements of their teaching positions.

210. RAWSON, ERNEST J. (Masters). ***A Pattern of Professional and General Education Courses for Industrial Arts Majors at Peru State Teachers' College.*** **Colorado A. & M. College, 1944.**

211. READDICK, DAVID L. ***Student Teaching in Industrial Arts-Education.*** **M.A., 1949, Ohio State University. 157 p. Education Library, Ohio State University, Columbus.**

Purpose: To investigate the nature of student teaching in industrial arts education in selected colleges and universities as revealed through inquiry returns and to interpret the findings by way of summary and conclusions.

Source of Data: A survey of the 18 colleges and universities located in 15 States. Data were collected by a single inquiry.

Findings and Conclusions: There is no general pattern or best arrangement by which a particular program for student teaching may be conducted. Opportunity must exist for student learning, by direct experience, the relation between theory and practice. There is no reason to doubt that each program is not accomplishing its purpose in general. It is through the entire arrangement, student preparation, administrative aspects and student teacher experiences, that it is concluded that student teaching in industrial arts does provide the student with an opportunity to understand the relation between theory and practice.

212. ROUGON, PERCY V. ***Vocational Technical Training of College Grade.*** **M.S., 1952, Louisiana State University. 94 p. Library, Louisiana State University, Baton Rouge.**

Purpose: To ascertain the content of the industrial technology curricula offered by various colleges and universities throughout the United States, leading to an undergraduate degree.

Source of Data: Data were obtained from the 48 state supervisors of vocational trade and industrial education and from questionnaires sent to department heads of industrial education in 94 institutions, 15 of which offered the type of curricula with which the study is concerned.

Findings and Conclusions: A need exists for technical training of college grade. A considerable range existed in the curricula requirements relative to areas of specialization. Titles used to designate technical curricula differed with practically every institution. Practically all of the occupations represented in the major areas of industry were included in the total curricula studied. The majority of institutions did not have a separate and distinct curriculum for each occupational area offered. The technical occupations for which training was given at the college level were similar, and in many cases identical with the occupations for which training was provided in terminal curricula.

213. SCHAD, JOSEPH A. ***Development of a Four-Year Industrial Arts Education Curriculum for Virginia Polytechnic Institute.*** **M.S., in Ed., 1950, Cornell University. 134 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: To ascertain whether certain experiences were or were not included in the undergraduate training program of Virginia teachers of industrial arts. To secure opinions of Virginia teachers of industrial arts with respect to emphasis that should be placed on certain tasks or experiences in the teacher preparation program. To study the curriculum offerings of selected industrial arts teacher education institutions which furnish Virginia with Teachers of industrial arts.

Source of Data: A questionnaire was sent to 163 in the State (Virginia) covering the following: Experience of instructors, objectives and program, reactions to course offerings, and evaluation of selected classroom experiences. Eighty-one questionnaires were returned.

Findings and Conclusions: The author lists 9 sources to obtain ideas for principles in curriculum construction. He then enumerates 14 criteria for judging the effectiveness of democratic procedures. Thirty-nine guiding principles for the teachers of industrial arts are submitted.

214. SCHARA, ALFRED J. (M.A.). ***The Curriculum of Industrial Education at the Oshkosh State Teachers College.*** **Colorado State College of Education, 1938. 59 p.**

An evaluation of an industrial education professional preparation program in terms of what teachers have to teach.

215. SCHULTZ, HENRY DAVID (M.A.). ***The Status of Industrial Arts at Berea College.*** **George Peabody College, 1938. 81 p.**

A survey of some of the graduates of Berea College in an effort to discover the relative value of Berea's industrial arts program. The trend of the aims of industrial arts in junior and senior high schools (grades 7 to 12 inclusive) is considered.

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216. **SILVIUS, G. HAROLD (Ed.D.).** *Instructional Units for Professional Courses in Undergraduate Industrial Arts Teacher Education.* Pennsylvania State College, 1946. 460 p.

An analysis of the relative importance of 160 units of professional preparation of undergraduates in industrial arts education based upon a survey of 750 outstanding teachers of industrial arts, eighty of whom were classified and whose responses were treated as a special group of the highest type.

217. **STARKEY, HARRY ARTHUR.** *A Survey of the Industrial Arts Programs of the Colleges and Junior Colleges of Kansas.* M.S. in Ind. Ed., Kansas State Teachers College, 1941. 75 p.

An account of the industrial arts offerings in the junior and senior colleges of Kansas.

218. **STEPHENS, ROY A. (M.A.).** *Teacher Training in Industrial Education at Colorado State Teachers College.* Colorado State College of Education, 1932. 96 p.

A survey of A.B. graduates in industrial arts to evaluate their college preparation in the light of job requirements.

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219. **STONER, WILLIAM D. (Doctors).** *Industrial Arts Teacher Education in Ohio.* Ohio State University, 1940.

220. **STREET, CALVIN M. (M.S.).** *Training for Industrial Arts Teachers in the State Supported Colleges of Tennessee.* University of Tennessee, 1946.

An analytical description of the training of industrial arts teachers in six State-supported colleges from 1935 to the school year 1945–1946. The type of program offered, the equipment, courses of study, and enrollments in each school as of 1945–1946 are discussed.

221. **THOMAS, ALVIN I.** *The Industrial Education Curricula for Teacher Training in Negro Colleges and Universities of the United States.* M.S. in Ind. Ed., 1949, Kansas State Teachers College. 157 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To indicate present practices and standards as regards the teacher education curriculum for industrial arts in the Negro colleges and universities of the United States.

Source of Data: Analysis of catalogs and bulletins; correspondence with department heads and faculty; personal visitation (and interviews) with selected institutions. Evaluative criteria were established and used in making comparisons.

Findings and Conclusions: Negro schools offering industrial education for teacher training have designed these programs to incorporate the needs of their students and the localities in which the schools are found. Titles of departments varied greatly; the doctorate was held by an average of 0.17 faculty member per school; 5 different types of bachelor degree titles were offered; the hours required for graduation ranged from 220 quarter hours to 180 quarter hours. Thirty-four different courses were offered; professional educational courses and academic courses were satisfactory to meet manipulative skills.

222. **THOMPSON, JAMES WILLIAM.** *Value of the Master of Science Program in Industrial Education at the Iowa State College as Rated by Former Students.* M.S., 1949, Iowa State College. 63 p. Library, Iowa State College, Ames.

Purpose: To determine the value of the Master of Science Program in Industrial Education to former students and to provide certain information concerning the nature of the occupational activities of the graduates.

Source of Data: Data collected by means of a check list mailed to all individuals living in the U.S. who had completed the program between 1933 and 1948 inclusive. Findings represented in a number (39) of tables.

Findings and Conclusions: As a satisfactory supplement to the undergraduate program a high degree of satisfaction was reported by 70 percent. As a means of increasing the earning ability of the graduate, 79.7 percent reported program had paid off in increased earning power. As a means of increasing the satisfaction of the graduate with his work, 91.9 percent reported job satisfaction was increased. In regard to certain specific requirements for graduation: should 30 quarter hours of credit in a major field and 15 quarter hours of credit in a minor field be required to qualify for the Master's degree?—71.5 percent reported yes. If you were repeating your graduate work and were allowed the choice of either writing or not writing a thesis, would you choose to write a thesis? There was an almost equal response; 46.3 percent reported yes; 48.8 percent reported no; 4.9 percent were non-committal.

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223. TURNER, BRIDGES ALFRED (Ed.D.). *Objectives and Problems of Industrial Education in Negro Colleges.* Pennsylvania State College, 1941. 138 p.

A study of the existing regulations, the objectives, descriptions, teachers, and students in the Negro colleges of the seventeen states in which separate schools are maintained. A plan to improve industrial education programs in Negro schools is suggested.

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224. VOLK, A. VINCENT. *The Status of Men Admitted to Graduate Studies on Scholastic Probation at Stout State College, 1935–1955.* M.S., 1955, Stout State College. 107 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain whether probationers graduated at the same rate as did men admitted unconditionally, whether they were rated by their administrators equally successful in teaching, and whether the number of probationers admitted is increasing.

Source of Data: Data were obtained from a study of 200 men selected at random from the graduate population of Stout State College. Of this group, 100 had received Master's degrees and 100 had not. Additional data were obtained from a study of administrators' ratings of teachers with Master's degrees.

Findings and Conclusions: Men admitted on probation to the Graduate Program did graduate, but the rate of drop-outs was greater in the probationary group than in the non-probationary group. No significant relation was found between graduate grade point average and number of drop-outs. Men admitted on probation to the Graduate Program were rated as highly on teaching factors by their administrators as were men admitted unconditionally.

225. WAKE, SELMER O. (Masters). *An Investigation of the Need for a College Program in Graphic Arts on the Pacific Coast.* Oregon State College, 1946.

226. WALKER, DEMPSEY LOGAN. *Requirements for the Baccalaureate Degree in Industrial Arts Education in Twenty Five Colleges and Universities.* M.S., 1955, Kansas State Teachers College. 64 p. Industrial Education and Art Department and Library, Kansas State Teachers College, Pittsburg.

Purpose: To analyze the curricula of several teacher education institutions in the United States to discover the curriculum areas that are generally considered essential for the baccalaureate degree with a major in industrial arts.

Source of Data: Data were obtained from catalogs and bulletins of the institutions considered.

Findings and Conclusions: Wide differences exist in the various requirements. The mean requirement for a degree was 127 semester hours while the mean requirement for an industrial arts major was 42.52 semester hours.

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227. WALL, GUSTAVE S. *Dual Purpose Industrial Education at the College Level.* Ph.D., 1951, University of Minnesota. 263 p. Library, University of Minnesota, Minneapolis.

Purpose: To ascertain beliefs and practices in industrial teacher education leading to justification of a curriculum providing preparation for teaching and for entrance into an industrial occupation.

Source of Data: Data were obtained from a normative survey utilising two instruments to compile the opinions of 492 industrial teacher educators and the practices in 109 institutions located throughout the United States.

Findings and Conclusions: Industrial arts teacher education curricula should require equal emphasis in three areas—general, professional, and shop and drawing. A curriculum providing dual purpose organization and content is desirable.

228. WENRICH, RALPH C. (M.S.). *An Evaluation of Professional Industrial Education Courses as to Their Usefulness in Teaching.* Pennsylvania State College, 1934. 48 p.

Investigates the effectiveness of professional courses in the field of industrial education to ascertain their usefulness in actual teaching. Remedial measures are recommended.

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229. WHITESEL, JOHN A. (Doctors). *Industrial Arts Leadership Programs in the States.* Ohio State University, 1940.

230. WHITING, FRANCIS F. *The Industrial Education Department of the University of Minnesota.* M. A., University of Minnesota, 1938. 50 p.

A detailed 10-year study of the Industrial Education Department of the University of Minnesota covering courses, enrollments, grades, trends, etc.

231. WHITNEY, HARRY H. (M.S.). *Survey of Industrial Arts Curricula in State Teachers Colleges Accredited by the North Central Association.* Colorado Agricultural & Mechanical College, 1933. 83 p.

A study of the entrance requirements, faculty qualifications, shop facilities, general training, curricular standards, distribution of required credits, and major and minor courses in twenty-two teacher training institutions accredited by the North Central Association.

232. WIENER, MERLE O. *Research in Industrial Education for Advanced Degrees at Iowa State College Prior to 1950.* M.S., 1950, Iowa State College. 292 p. Library, Iowa State College, Ames.

Purpose: To make abstracts and summarize the findings of all research in industrial education at Iowa State College from 1925 to 1950.

Source of Data: Each of the 230 theses were examined and an abstract written. They were then divided into 11 different classifications. A summary was written for each classification in which the finding of each thesis in that group was mentioned.

Findings and Conclusions: No findings or interpretations reported.

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233. WILBER, GEORGE O. (Doctors) *Evaluation in Industrial Arts Teacher Education: A Planning Study to Develop a Comprehensive Program of Appraisal in the Upper Division of an Institution Engaged in the Preparation of Industrial Arts Teachers.* Ohio State University, 1941.

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234. WILSON, WADE. *Selected Recommendations for Industrial Arts Education: A Study Based on the Expressed Occupational Experiences and Needs of the Graduates of the State Teachers Colleges in the Commonwealth of Pennsylvania.* Ed. D., 1954, New York University. 272 p. Library, New York University, New York.*

Purpose: To ascertain the adequacy of the preparation of the graduates as reflected in curriculum content, the ability of the graduates to recognize and solve the problems of youth, the recognition of and the selection of objectives for the program, and recommendations for an improved program.

Source of Data: Data were secured through a questionnaire which was supplemented by visitations and interviews. The study was limited to the graduates of the industrial arts curriculum as offered in three of the state teachers colleges in Pennsylvania.

Findings and Conclusions: The responses suggested fourteen recommendations essential to a revitalized program of industrial arts education in Pennsylvania. These recommendations indicated the need for a broader industrial arts program on the secondary level, the use of community resources, the services of a functional placement service, the importance of summer work experiences for student and faculty personnel, means for the enrichment of the student teaching program, a critical re-examination of the objectives, and the need for adequate funds for the program.

235. WOODS, HAROLD O. *The Machine Shop in Industrial Arts Teacher Preparation.* M.S., 1949, Oklahoma Agricultural and Mechanical College. 79 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To show the need of machine shop instruction as a part of the industrial arts program and to inspire prospective industrial arts teachers to take machine shop courses.

Source of Data: The ideas expressed in this report are those obtained from an extended study of textbooks, educational magazines, theses, reports and other related material as well as literature from industrial organizations.

Findings and Conclusions: Machine shop practice, as a unit course or as part of the general metal work course, makes it possible for the individual to become acquainted with a broader range of materials. Processes, designs, and human relationships are involved. An appreciation and understanding of these things contribute to the cultural growth of the individual.

Equipment

236. **APPLEGATE, BURNELL (M.S.).** *Recommended Criteria For the Selection of Power Woodworking Equipment for the Industrial Arts Laboratory,* Iowa State College, 1936. 76 p.

A report of opinions of twenty industrial arts instructors covering criteria for selection of power woodworking equipment. It consists of recommendations for the band saw, the circular saw, and the jointer.

237. **BELL, JAMES R.** *Jigs And Fixtures In The Wood Shop.* M.S., 1953, Kansas State Teachers College. 51 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To study jigs and fixtures in common use in woodshops, collect, and classify them.

Source of Data: Data were obtained by interview methods with forty school and college wood shop instructors, and with furniture and factory superintendents. Available literature was analyzed.

Findings and Conclusions: Jig or fixture development arises first from the need to do a particular job. Jigs and fixtures should be as simple to make and use as is consistent with the job they are to do. They should be quick and easy to operate. In the school shop they should provide a means of teaching productive methods to the student.

238. **BENGSTON, FRANK A.** *A Collection of Jigs Used on Common Woodwork Machines.* M.A., 1952, University of Minnesota. 85 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To suggest by drawings, information, and bibliographical citations the use of some of the common jigs used in woodwork machinery operations.

Source of Data: Data were obtained from available literature.

Findings and Conclusions: Drawings and brief instructions for thirty jigs used on six types of machines were developed.

239. **BINGHAM, MORLEY P.** *Inexpensive Equipment for a Unit in Foundry Work In Industrial Arts.* M.Ed., 1952, Colorado Agricultural and Mechanical College. 76 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To identify and describe the equipment that can be made in school shops economically and still fulfill safety requirements.

Source of Data: Data were obtained from questionnaires sent to industrial arts teachers in the Detroit, Michigan area who teach foundry work.

Findings and Conclusions: Although most foundry equipment can be made in the school shop at a considerable saving, only a few articles should be undertaken unless a lack of finances makes it essential. Greatest savings can be achieved by constructing the melting furnace and benches.

240. **BOYER, J. L.** *Minimum Machinery and Equipment for Vocational Printing.* M.S., Oklahoma Agricultural and Mechanical College, 1948. 40 p.

A list of minimum standards for machinery and equipment for vocational printing classes.

246. **BROWN, VINCENT OTIS.** *Some Desirable Features of Power Machines Used in the Woodworking Area of the General Shop* M.A., 1953, The Ohio State University. 71 p. Library, The Ohio State University, Columbus.

Purpose: To determine just what features should go into the power equipment of a general shop wodworking area.

Source of Data: Data were obtained from a questionnaire circulated to two schools in each of the 88 counties in Ohio that had a general shop program where the instructor had four or more years of teaching experience. Manufacturers of equipment suitable for use in a general shop were contacted.

Findings and Conclusions: The most desired features machines should have were: sealed ball or roller bearings, 220 volt power, "v" belt or direct drive, individual base, do only one job, and safety features that are an integral part of the machine.

242. **BROWN, WILLIAM O.** *Recommended Floor Space for Woodworking Machines and Equipment in Industrial Arts Shops.* M.Ed., 1952, Wayne University. 32 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To ascertain the amount of floor space required for woodworking machines and equipment in industrial arts shops.

Source of Data: Data were obtained through visits, scientific experimentation, and information received from manufacturers.

Findings and Conclusions: Recommendations for adoption of standards are made with suggestions for further study.

243. COPE, WALTER A. (Masters). *Equipment and Equipment Specifications for General Metal: Masters for Junior and Senior High School Levels.* Ohio State University, 1933.

244. COSS, CHARLES FRANCIS. *The Designing and Construction of Low Cost Power Tools and Equipment.* M.Ed., 1952, The Ohio State University. 72 p. Library, The Ohio State University, Columbus.

Purpose: To develop several inexpensive pieces of equipment for use in a general metals laboratory in an Ohio high school.

Source of Data: The writer adapted a number of standard commercial parts into well-designed, safe, and economical pieces of equipment.

Findings and Conclusions: It is possible with limited funds, ingenuity, and originality to build worthwhile, safe and well-designed pieces of equipment while providing valuable learning experiences for students.

245. EKSTROM, KENNETH G. *Shop-built Equipment for Use in Industrial Arts Installations.* M.S., 1952, Oklahoma Agricultural and Mechanical College. 103 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile information on shopbuilt equipment to aid in the improvement of the physical facilities and the teaching situation.

Source of Data: Data were obtained from books, magazines and pamphlets.

Findings and Conclusions: Very little has been published on student-built equipment. However, many items can be found in various publications. These were brought together in this study.

246. ELLEDGE, WILSON H. *A Simple Forming Die That Can Be Built in Most High School Machine Shops.* M.A., 1954, Chico State College, 42 p. Library, Chico State College, Chico, California.

Purpose: To design and construct a low-cost rubber and metal die-set and to test the feasibility of such a project in high school shop practice.

Source of Data: Data were secured through literature and experimentation in the shop.

Findings and Conclusions: The making of this forming die would bring the latest commercial methods of die-forming metals right into the school shop. The uniqueness and appeal of creating an industrial project would develop student interest.

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247. ERICKSON, JOHN HOWARD *Recommended Equipment Requirements for Comprehensive General Shops Based on Certain Industrial Arts Activities for the Junior High School.* Ed.D., 1953, The Pennsylvania State University. 128 p. Library, The Pennsylvania State University, University Park.

Purpose: To arrive at scientifically determined quantities of equipment for junior high school general shops based on certain industrial arts activities and objectives.

Source of Data: Data were obtained from a nation wide survey of 223 selected teachers of industrial arts.

Findings and Conclusions: The quantities of equipment considered essential is given for the areas of electricity, graphic arts metalwork, and woodwork. Items considered useful are presented as general equipment. Industrial arts aims stressed in general industrial arts seems to have little affect upon the equipment recommended for such a shop.

248. GRAHAM, L. M. *An Analysis of the Power Working Equipment in the High Schools of Texas.* M.S., 1949, North Texas State College. 82 p. Library, North Texas State College, Denton.

Purpose: To gather information on the condition of the power woodworking equipment used for instructional purposes in the high schools in Texas—the amount of money needed to repair and maintain this equipment, the policies followed by schools in purchasing and maintaining equipment, the makes of machinery most frequently found, the age of equipment, and the makes and types of woodworking machines preferred by the instructors.

Source of Data: A questionnaire was sent to the instructors and supervisors of woodwork in accredited four-year high schools of Texas.

Findings and Conclusions: The woodworking machines most frequently found in the high school shops were the circular saw, the wood lathe, and the jointer, in the order mentioned. There was a total of 1,628 power woodworking machines in the 162 schools, or an average of 10 machines per shop. Most industrial arts teachers do not feel that they have had enough training and experience in the selection, purchasing, and maintenance of power equipment. A majority of the high schools which offer machine woodwork are accredited. Many schools have neglected to provide for the maintenance and purchasing of shop equipment in their annual budgets.

249. FIESTER, CHARLES DONNAN (M.A.). *The Reorganization of Industrial Arts Courses to Conform to the General Shop Program.* State University of Iowa, 1938. 125 p.

A study aiming to present in systematic form, so they can be easily recognized, the principles involved in organizing and equipping a general shop for a small school with various helps and suggestions for solution of the problems involved in planning the general shop course of instruction.

250. HENDRIX, ALFRED GRANT. *Controlling Principles of Woodworking Machine Selection.* M.S., Oklahoma Agricultural and Mechanical College, 1942. 94 p.

An analysis of woodworking machines with special reference to their suitability and use in the school shop. Three classifications of woodworking machines—home workshop type, school industrial arts type, and the production type—are discussed and evaluated for use in the school shop. Criteria for the selection of common woodworking machines are evolved covering the first two classifications.

251. HERDLE, WILLIAM A. (M.Ed.). *A Study to Determine the Most Desirable Features of Power Machine Equipment Commonly used in Junior High School Industrial Arts Shops.* Pennsylvania State College, 1948. 54 p.

Investigates the important features of the power machines most commonly used in junior high school general shops throughout the United States.

252. JACKSON, HARRY RANDOLPH (M.S.). *A Study of Home Made Machinery for the Purpose of Equipping the Small School Shop.* Indiana University, 1935. 103 p.

This study was made in 1934–1935 and deals with machines made by teachers of industrial arts and used in the shops of small high schools. Industrial arts teachers in 175 small school shops and ten teachers in other states contributed information on the machines they had constructed to meet shop needs.

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253. KLEHM, WALTER ALLEN (Ed.D.). *A Method of Determining Equipment Requirements in Industrial Arts Based Upon Teaching Objectives.* University of Missouri, 1937. 362 p.

After describing present procedures for determining shop equipment needs, the author proposes a new objective method. This method is then illustrated by its application to a course in woodwork and drawing. Working drawings and job plans for over two hundred woodworking and drawing projects are included.

254. KLINE, PHILLIP S. *An Investigation of the Uses and Conditioning of Wood Shaper Cutters.* M.S., 1953, Oklahoma Agricultural and Mechanical College. 78 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To investigate the types of wood shaper cutters and the proper methods of conditioning them.

Source of Data: Data were obtained through letters to manufacturers of shaper cutters, magazine articles, pamphlets and drawings.

Findings and Conclusions: High speed and carbide tipped steel is being used more than carbon steel because of its ability to withstand the excessive abuse imposed upon cutters. Solid shaper cutters are the safest for use in the school shop but are not as versatile as loose knife cutters.

255. LANDIS, ERNEST ANTHONY (M.S. in Ed.). *A Critical Study of the Woodworking Machinery Used in the Junior High Schools of California.* University of Southern California, 1934. 59 p.

A study to determine the most practical type of woodworking machines to use in junior high school in terms of cost, maintenance, safety, service, and general cost of repairs. It lists specific makes in each type of machinery, giving advantages and disadvantages of each.

256. **LARRICK, W. DONALD** (Masters). *Ceramic Kiln Design and Construction: Development of a Small Gas-Fired Kiln Suitable for School and Studio Use.* Ohio State University, 1936.

257. **MacLEOD, R. BRUCE** (M.A.). *Printing Equipment in the Secondary Schools.* Colorado State College of Education, 1932. 89 p.

A survey of 276 teachers in twenty-five states to determine the minimum requirements for equipment and supplies in printing courses of secondary schools.

258. **MARTIN, FREDERICK DOUGLAS.** *Selection of Equipment for the Winnipeg Technical Vocational High School.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 118 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To study the selection of equipment, tools and supplies needed to equip work stations for 15 students in the jewelry, lapidary and art metalwork areas of Wing C of the Winnipeg Technical-Vocational School.

Source of Data: Sources of data were texts on jewelry, lapidary and art metalwork catalogs and the criticism of a jury of 47 provided the data.

Findings and Conclusions: Based upon a study of the texts and catalogs relating to the 3 fields of crafts, a suggested list of equipment was submitted to the jury for criticism and modification. Modified lists, 1 for each activity, were formulated from suggestions and criticisms received.

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259. **MC ARTHUR, ROSS J.** *Selection and Management of Industrial Arts Equipment in the Secondary Schools of Missouri.* Ed.D., 1955, University of Missouri. 213 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain what major equipment is found in industrial arts shops in Missouri, the current practices used in equipping and maintaining shops in the state, and how these practices compare with practices and procedures recommended by a selected group of specialists in the field.

Source of Data: Information regarding practices and procedures used was obtained through information forms submitted to industrial arts teachers in the state and to superintendents with industrial arts teachers on their staffs. This information was compared with opinions of selected teacher trainers throughout the United States, concerning preferred or desirable practices, obtained through information forms submitted to them.

Findings and Conclusions: The most important factors in the selection of equipment were safety features, educational value, and quality. Equipment in use is often smaller than what specialists recommend. Few teachers reported fixed equipment budgets. Maintenance is not usually allowed for or integrated into the instructional program, nor are teachers adequately prepared to perform this function. The majority of schools use industrial arts equipment for upkeep of the school plant, although specialists do not favor this practice. Obsolescence is not given enough consideration in replacement practices. A shortage of funds for equipment often leads to poor practices in selection and management of equipment. Many small schools cannot justify further expenditure of funds for equipment with present enrollment and limited use of equipment. Maintenance and inventory are not stressed enough in the training of teachers. In general, procedures and practices used in procurement and management of equipment compare favorably with those recommended by specialists.

260. **McCAIN, HORACE KENNETH** (M.S.). *A Survey of the Amount of Equipment Available for Instructional Use In Industrial Arts In The High Schools of Texas.* North Texas State College, 1948. 73 p.

A description of the nature and amount of equipment available in certain high schools of Texas.

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261. **MC GAW, SIDNEY EDWIN.** *Equipment Needs for Vocational Machine Shop Classes.* Ed.D., 1952, University of California. 136 p. Library, University of California, Berkeley.

Purpose: To develop a procedure for ascertaining the most appropriate equipment for pre-employment training in a vocation-industrial education program; and to apply this procedure in determining the major equipment needs for skill training.

Source of Data: Data were obtained from course objectives, occupational analysis, course of study outlines, surveys of equipment, equipment use studies, and from questionnaires to vocational machine shop instructors, trade advisory committee members, and from the apprentice standards in use in the San Francisco and surrounding bay areas.

Findings and Conclusions: Equipment should be obtained which will meet the educational objectives, and should be selected to suit specific training needs in terms of planned maximum usage. Each shop should have a variety of equipment sufficient to teach efficiently the skills in the course of study, plus sufficient duplicate facilities to provide training stations for a determined load on a planned instructional basis. A recommended list of major equipment items for a pre-apprentice class was developed.

262. McKNIGHT, HORACE K. ***Power Machines in the General Building Trades in Tennessee.*** **M.S., 1953, University of Tennessee. 77 p. Library, University of Tennessee, Knoxville.**

Purpose: To explore the use of power machines in the general building trades and trade preparatory classes in machine woodworking in Tennessee.

Source of Data: Data were secured from the files of the Trade and Industrial Service, Tennessee State Department of Education, and from publications.

Findings and Conclusions: There were 277 machines, including 17 different machines, being used in the 22 programs. These machines were found to be similar to those used in woodworking and builder's shops.

263. MELBERG, MERRITT EUGENE (M.S.). ***Equipment for Junior High Metal Shops.*** **Iowa State College, 1946. 48 p.**

A survey of the opinions of instructors in Iowa junior high schools on the value of various tools and equipment for metalworking shops.

264. MILES, CLARENCE WILLIAM. ***Cost of Shop Equipment Per Student in the Hutchinson Public Schools, Hutchinson, Kansas.*** **M.S., 1954, Kansas State Teachers College. 45 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To ascertain the approximate per capita cost of industrial arts on the several grade levels in the Hutchinson Public Schools.

Source of Data: Data were obtained from an analysis of the enrollment records of the different shop classes for the past ten years and the shop inventories of the same period. U. S. Bureau of Internal Revenue depreciation methods were used.

Findings and Conclusions: A formula was devised whereby per capita cost could be found. Cost of all equipment per student a year was lowest in the junior high school; in the senior high school and junior college costs were about the same.

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265. MILLER, JOHN G. ***The Evolution of Machines and Equipment Studied in the Industrial-Arts Comprehensive General Shop.*** **Ed. D., 1954, New York University. 578 p. Library, New York University, New York.***

Purpose: To ascertain the historic and socioeconomic factors which have influenced the development of the present-day machines and equipment used in the comprehensive general shop.

Source of Data: Data were gathered from libraries, museums, and industries, both in this country and abroad, and treated in the historical method.

Findings and Conclusions: Thirty monographs were written concerning machines and equipment considered most important as shown by the study. These monographs were written and tested on students of industrial arts in the secondary schools. Illustrations and vocabulary glossary were generously used where practicable.

266. MORGAN, JOHN B. ***A Comparative Study of the Kinds of Woodworking Machines Used in Wisconsin Senior High School Industrial Arts Shops.*** **M.S., 1951, Stout State College. 124 p. Library, Stout State College, Menomonie, Wisconsin.**

Purpose: To provide machine woodworking instructors with essential information about the leading woodworking machines.

Source of Data: Data were obtained from the latest manufacturer's catalogs, pamphlets, personal letters, and from an inquiry sent to Wisconsin senior high school machine woodworking instructors.

Findings and Conclusions: In most cases, the heavy, expensive machinery is the best. However, the trend seems to be for schools to buy lighter weight machinery built especially for school shop use. The Delta woodworking machines and the Porter-Cable portable sander are the most popular in Wisconsin schools.

267. **NIEMAN, THEODORE LEWIS (M.S.).** ***Motorized Woodworking Equipment in Public Senior High Schools of Central Illinois.*** **Iowa State College, 1938. 78 p.**

A study on some of the significant questions pertaining to the motorized machines that are being used, their condition and possible reason for their condition, principal machine features, trends in equipment, leading manufacturers of each machine, and the changes in the activity of manufacturers.

268. **OGLE, JOHN S., Jr.** ***Jigs for Use in a High School Woodworking Shop.*** **M.S., 1949, Oklahoma Agricultural and Mechanical College. 48 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To present principles and drawings of jigs so the student will have a thorough understanding of jigs, their construction and use.

Source of Data: Material in this report was gathered from various periodicals, pamphlets, and instructional books. Drawings and procedures for the construction of a few of the most useful jigs were made. A number of additional jigs are described.

Findings and Conclusions: Jigs, such as those presented in this report, will aid in obtaining a maximum of efficiency from a machine. They should be constructed and used when the occasion arises, by those who desire to learn all of the different aspects of machine woodworking. A person who is well acquainted with jigs and their uses will find it easy to solve most of the problems that confront the woodworker.

269. **PAUSTIAN, HENRY J. (Masters).** ***Standard Equipment and Supplies for Seventh Grade Industrial Arts.*** **University of Wisconsin, 1932.**

270. **PENNY, ALVA DUDLEY (M.S.).** ***Equipment and Maintenance of an Industrial Education Department in a Modern High School.*** **East Texas State Teachers College, 1948. 138 p.**

A description of industrial arts equipment and its maintenance in a modern high school. Included is a discussion of the functions and duties of a teacher in the selection and maintenance of the equipment and supplies.

271. **PETRICOLAS, SAM C.** ***A Study of Single-Point Lathe Tools.*** **M.S. 1950, Oklahoma Agricultural and Mechanical College. 99 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To investigate the characteristics and functions of single-point lathe tools with respect to cutting action and their application to specific lathe problems.

Source of Data: Study of engineering and technical publications to secure data about cutting tools, cutting processes, and cutting action. Experimental test cuts were made, and their results used to illustrate principles and concepts of cutting action.

Findings and Conclusions: The complexity of the cutting process makes it essential to supplement the teaching of the elements of cutting action with photographs to explain the nature of what is occurring in the cut. With the aid of magnified photographs, the teaching of cause and effect relationships in lathe cutting is easier because of the additional detail. Cutting action takes place at such high speeds that it is practically impossible to learn what occurs by direct observation. Magnified photographs of tools stopped in different cuts revealed details of chip formation and surface finish that aid considerably in explaining cutting action.

272. **ROGERS, BERT K.** ***The Comparative Cost of Equipping a Comprehensive General Shop in Years 1939 and 1949.*** **M.S. in Ind. Ed., 1950, Kansas State Teachers College. 52 p. Porter Library, Kansas State Teachers College, Pittsburg.**

Purpose: To find the total cost; percentage increase of costs over the 10 year period; to indicate possible costs to transform present general shop at Kansas State Teachers College.

Source of Data: Analysis of machine tool catalogs; personal letters; visits to retail companies.

Findings and Conclusions: The report covers power machinery, hand tools, sheet metal machinery, furniture, and miscellaneous. Index of labor costs on machinery and machine shop products. 1939—100.0, 1949—211.2. Index of wholesale prices of raw materials used on metal and metal products: 1939—100.0, 1949—175.8.

273. **SCHELL, JOSEPH WILLIAM (M.S.).** ***A Study of the Courses and Equipment of a General Metal Shop.*** **Purdue University, 1930. 44 p.**

A comparative study of general metal shops of various sections of the United States to determine the areas covered, the sequence of areas, and the tools used in the metal shop course. An "ideal" sequence of areas is suggested.

274. SPIES, WILBUR G. (M.Ed.). *A Comparative Study of the Efficiency of Light and Heavy Power Woodworking Machinery.* **Ohio State University, 1947. 60 p.**

The purpose of this study was to determine if light or heavy power woodworking machinery is more desirable in the industrial arts laboratories of the schools of the state of Ohio, and to compare the advantages and disadvantages of light machines with those of heavy machines.

275. STANFORD, WILBUR S., Jr. *The Development of an Inexpensive Gas Fired Kiln For Use in the Small Shop.* **M.Ed., 1951, Agricultural and Mechanical College of Texas. 33 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.**

Purpose: To develop an inexpensive, gas fired muffle kiln for use in small commercial and public school shops.

Source of Data: Date were obtained from books, periodicals, and encyclopedias.

Findings and Conclusions: It is possible to produce a gas fired muffle kiln at low cost. This report contains descriptions and specifications for such a kiln.

276. STILES, DARRLE F. *School Shop Woodworking Equipment.* **M.S., 1950, Oklahoma Agricultural and Mechanical College. 76 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To discover types of woodworking machinery suitable for teaching purposes in industrial arts subjects.

Source of Data: An investigation and analysis of written reports on the subject of woodworking equipment; discussion with leaders in industrial arts fields; study of articles found in the Industrial Arts and Vocational Magazines; and a study of written information and specifications from various manufacturers of woodworking equipment.

Findings and Conclusions: An analysis should be made of the floor space required for each machine, the proper lighting conditions, accessibility to the aisles and provisions made for sequence of operations. Standard brands of equipment were recommended, and economical methods of purchase and inventory.

277. STOKES, JESS L. *Some Common Metal Fasteners That Are Used in the Industrial Arts Woodworking Shop.* **M.S., 1955, Oklahoma Agricultural and Mechanical College. 47 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To compile information about common metal fasteners that are used in the industrial arts woodworking shop.

Source of Data: Data were obtained from books, magazines, and manufacturers' literature.

Findings and Conclusions: There is little information available in textbooks concerning the clamp nail, joint nail, corrugated fastener and the skotch wood joiner.

278. STOVER, WALTER MALCOM. *A Survey of the Major Equipment in the Industrial Arts Shops in Tennessee High Schools in 1952.* **M.S., 1953, Oklahoma Agricultural and Mechanical College. 132 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To ascertain the status of industrial arts and the equipment used in the schools of Tennessee.

Source of Data: Data were obtained by questionnaire and visits to twenty-nine shops.

Findings and Conclusions: Offerings in industrial arts seem to represent the most commonly accepted subjects. Woodwork, mechanical drawing and general shop occur most frequently and in that order. Few industrial arts teachers were teaching full time in their field. All buildings, except one, were of masonry construction. Woodworking shops were best equipped.

279. TEAGUE, RUFUS D. *A Survey of Major Equipment in High School Shops of Oklahoma in 1949.* **M.S., 1950, Oklahoma Agricultural and Mechanical College. 113 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To find the kinds and quality of physical facilities provided for the teaching of industrial arts in Oklahoma high schools.

Source of Data: The comparison of factual information with minimum standards derived from the review of literature is the basis of this writing. A directory of Teachers and Administrators of Industrial Education in Oklahoma Secondary Schools, Colleges, and Universities, School Session 1948–1949, was used as a mailing list.

Findings and Conclusions: Some confusion exists in industrial arts as to what should be taught. It is likely that crowded conditions exist in the 54 school shops for which less than 1,200 square feet of floor area was reported. However, housing is adequate in a majority of the schools represented in this study. Equipment is adequate and of the proper kind for industrial arts classes in about half of the woodworking shops in Oklahoma high schools. The large number of new shops being built encourages the belief that industrial arts is achieving greater recognition in Oklahoma.

280. **TEARNEY, ORVILLE A.** (M.A.). *Physical Equipment and Courses for Study in Woodworking in the Junior High School.* Colorado State College of Education, 1931. 228 p.

A study to determine the type, character, extent, efficiency, and prospective changes of physical equipment used in teaching woodwork in the junior high school.

281. **WICKLUND, CARL B.** (M.S.). *An Analysis of New Tools, Equipment, and Supplies Used in the Instruction of General Drawing.* The Stout Institute, 1947. 53 p.

The writer develops a checklist of new materials available for use in general drawing by a survey of six manufacturers of drawing equipment. He sent this check list to thirty-six industrial arts department heads in Wisconsin to discover which of these materials they were using.

282. **WILHITE, OLIVER PERRY** (M.S.) *A Study of the Physical Equipment of Industrial Arts Wood Shops in Arkansas.* East Texas State Teachers College, 1942. 29 p.

A survey of housing, equipment, and teacher qualifications in the woodworking shops of Arkansas high schools, 1940–1942.

283. **WILLIAMS, WILLIAM ANDREW** (M.A.). *A Survey of Shop and Equipment Facilities in the Vocational Machine Shops of 26 West Virginia Secondary Schools 1946–1947.* West Virginia University, 1947. 99 p.

A survey of the existing facilities for teaching machine shop work in West Virginia. Minimum standards with regard to floor space, power tools, hand tools, and lighting conditions for the secondary school shop are suggested.

284. **YAEKLE, WILLIAM A.** (Masters). *An Analysis of the Functional Unit Plan as a Basis for Determining Equipment Needed in an Industrial Arts Shop.* Miami (Ohio) University, 1940.

285. **YOUNG, TALMADGE B.** *Some Principles For Maintenance of Equipment in the Industrial Arts Laboratory.* M. A. E., 1951, University of Florida. 79 p. Library, University of Florida, Gainesville.

Purpose: To discover and point out the importance of properly maintaining laboratory equipment and to offer a suggested teacher-training program for meeting these needs.

Source of Data: Data were obtained by questionnaires and interviews.

Findings and Conclusions: The teacher should have a broad knowledge of the general principles as well as specific knowledge of maintenance in the shops for which he is certified. The major duty of the industrial arts teacher in maintenance is to supervise care of equipment. He should be able to recognize the need for maintenance as it occurs.

286. **ZIMMERMAN, *Jr.*, G. FLOYD.** *Specifications and Recommendations For Machines in the Industrial Arts Laboratories in the State of Florida.* M. A. E., 1951, University of Florida. 136 p. Library, University of Florida, Gainesville.

Purpose: To propose recommendations as to sizes and models of power equipment for industrial arts programs and to prepare a reference guide for school purchasing agents.

Source of Data: Data were obtained by visits to industrial plants and to industrial arts laboratories throughout Florida, from representatives of leading machine tool manufacturers, pamphlets, catalogs, and a questionnaire sent to industrial arts instructors.

Findings and Conclusions: Recommendations are made concerning all major types of power equipment used in industrial arts shops.

Extracurricular Activities

287. ANDERSON, DONALD N. *A Comparison of the Leisure Time Interests of Students Who Have Studied Industrial Arts and of Those Who Have Not.* M.A., 1953, University of Minnesota. 59 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To ascertain whether a group of students who had taken industrial arts differed significantly from a group which had not taken industrial arts with respect to "worthy leisure-time interests."

Source of Data: Data were obtained from a two part interest inventory administered to all junior high school boys in three small Minnesota schools which offered industrial arts and three similar schools which did not offer industrial arts.

Findings and Conclusions: In spite of the fact that there was up to ninety percent overlapping of indicated preferences and activities, there was a quite positive indication that industrial arts experiences influence student responses to the inventory. The difference was significant at the one percent level. Urban students did not differ significantly from rural students on the same key.

288. BARTH, GEORGE ADAMS (M.S.). *The Industrial Arts as Adapted to Leisure Occupation.* Oregon State College, 1947. 70 p.

An anaylsis of hobbies and common industrial arts skills to discover the extent of contribution hobbies make toward industrial arts skills.

289. BAXTER, WILLIAM L. (M.S.) *The School Printing Club—An Analysis of the Organization and Practices of Printing Clubs Throughout the United States.* The Stout Institute, 1941. 91 p.

A study based on a survey of 160 printing instructors in the United States. The author traces the history, origin, and present status of printing clubs in the United States.

290. BECHTOLD, C. B. (M.S.) *Spare Time and School Interests of Cleveland High School Boys.* The Stout Institute, 1938. 80 p.

By surveying Cleveland, Ohio, high school boys, the author determined their avocational interests. In investigating the school system, he discovered inadequacies on the part of the school to fulfill these interests.

291. BENZ, LELAND A. (M.S.) *Advisability of Constructing Home Workshop Equipment in Industrial Arts Classes.* Iowa State College, 1940.

A survey of industrial arts teachers, students, and parents in Ames, Iowa, on the desirability of making home workshop equipment in the school shop.

292. BING, KENNETH L. (M.A.). *The Boy Scout Merit Badge System—Activities, Teaching Materials, Badge Requirements, and Award Procedure, with Special Reference to Industrial Arts.* University of Minnesota, 1933. 138 p.

A description of the history and organization of scouting followed by an analysis of ninety-eight merit badge requirements showing their relationships to public school industrial arts offerings.

293. BINGHAM, FORREST. *Status and Organization of Industrial Arts Co-Curricular Activities in Selected High Schools of the San Joaquin Valley.* M.S., 1954, Oregon State College. 76 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the number of industrial arts co-curricular activities available in the high schools of San Joaquin Valley, their purposes, extent of student participation and the organizational structure.

Source of Data: Data were secured by questionnaires sent to teachers in the San Joaquin Valley.

Findings and Conclusions: There are few industrial arts clubs organized. Students who might gain the most do not become members. Not enough time is allowed for the club activities.

294. BOYLES, WILLIAM J. *Recreational Handicrafts on the College Level.* M.S., 1952, Florida State University. 41 p. Library, Florida State University, Tallahassee.

Purpose: To ascertain the extent of participation, materials, and tools used in college recreational handicrafts programs.

Source of Data: Data were obtained by questionnaire.

Findings and Conclusions: Just under thirty-five percent of colleges reporting had crafts programs. Others expressed desire or need. Four leading crafts materials are art metals, leather, linoleum block printing, and wood. A total of 29 materials or classes of materials were reported.

295. BROCK, JOHN LELAND (M.A.). *The American Craftsman League in South Carolina.* George Peabody College, 1936. 125 p.

A review of magazines, books, and pamphlets in an effort to point up the need for the development of clubs in industrial arts education. Data concerning the establishment of these clubs in South Carolina are included.

296. BROWN, ORVILLE OSCAR. *Supplementary Incomes of Industrial Arts Teachers in Illinois.* M.S., 1953, Illinois State Normal University. 89 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the number of industrial arts teachers who supplement their regular teaching salaries by extra employment and how this affects their relationships with the school administration, employers, and labor unions.

Source of Data: Data were gathered by use of questionnaires sent to industrial arts teachers and their schools administrators.

Findings and Conclusions: Ninety percent of the industrial arts teachers surveyed supplement their teaching salaries. The school board and administrators are responsible for rules and regulations governing extra work. A majority of the teachers did supplementary work in the areas of woodworking, metal working, and mechanical drawing. The primary sources of employment were the board of education, private contractors, and factories. One out of every six teachers joined a labor union. Teachers and administrators felt the extra work had little influence on their teaching.

297. BUSBY, JAY. *Teaching and Extra Curricular Duties of Industrial Arts Teachers.* M.Ed., 1949, Colorado Agricultural and Mechanical College. 67 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the teaching and extra-curricular combinations of the industrial arts teachers of Iowa.

Source of Data: Thirty schools were selected throughout Iowa. The State was divided into 4 quarter sections, 7 schools being selected from each, the 2 remaining were selected at large. Questionnaires were sent to the industrial arts instructors in these schools.

Findings and Conclusions: Fourteen of the 30 instructors coach. Thirteen of the 30 industrial arts instructors taught only industrial arts subjects. Eleven of the 30 teachers were engaged in teaching one or more academic subjects. Prospective teachers of industrial arts should prepare to teach other subjects as well.

298. CASAL, JOE. *Industrial Arts—A Summer Recreational Program for Adults.* M.A., 1951, Sam Houston State Teachers College. 60 p. Library, Sam Houston State Teachers College, Huntsville, Texas.

Purpose: To identify elements that may be incorporated in a summer recreational program of industrial arts for adults.

Source of Data: Data were secured from library materials and conferences with industrial arts teachers.

Findings and Conclusions: Worthy objectives can be achieved through an industrial arts recreational program for adults. Public school shops are readily adaptable for use. There are advantages for the school and community in including such an industrial arts course.

299. COPP, WILLIAM HAMILTON. *The Industrial Arts School Camp.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 138 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the attitude toward the development of the school camp as stimulated by the Industrial Arts Department.

Source of Data: By means of a questionnaire to directors and personnel of various school camps the extent of the school camp program was determined. Much literature was reviewed.

Findings and Conclusions: An industrial arts school camp can be integrated with specific community recreation interests.

300. DAY, CHARLES MILTON (M.A.). *A Course of Study in Elementary Photography Which May Be Used as Either a Curricular or an Extra-Curricular Activity in the Secondary School.* Colorado State College of Education, 1940. 109 p.

The organization and development of two courses of study in photography for secondary schools.

301. **DESELLE, ERVIN JAMES (M.S.).** *A Survey of Extra-Curricular Activities of Industrial Arts Teachers in Oregon.* Oregon State College, 1937. 51 p.

A questionnaire study to determine the extent and nature of the extra-curricular activities carried on by the industrial arts teachers of the state of Oregon. The data submitted are based on the replies from sixty-three industrial arts teachers.

302. **DETLING, DONALD GENE.** *A Survey of the Teaching Program of Seventy-Six Industrial Arts Teachers In Northern California With Special Emphasis on Extra-Curricular and Other Duties.* M.A., 1952, Chico State College. 46 p. Library, Chico State College, Chico, California.

Purpose: To ascertain the extra-curricular duties of industrial arts teachers of Northern California, the number of different subjects taught, the extra-curricular areas for which additional training was desirable, and how teacher training programs can be improved.

Source of Data: Data were obtained from questionnaires mailed to industrial arts teachers in fifty-eight different high schools in Northern California.

Findings and Conclusions: Industrial arts teachers are required to participate in many extra-curricular activities and feel that teacher training institutions should provide counseling and training in this phase of educational work.

303. **DILLON, JOHN HOWARD (M.S.).** *The Status of Industrial Education Club Work in Indiana.* Indiana University, 1933. 133 p.

A study of the organization, tabulation, interpretation, and presentation of data relating to thirty-five industrial education clubs in the state of Indiana. It includes the general principles and policies of extra-curricular organizations and the activities of Indiana industrial education clubs.

304. **ELLIOTT, JEROLD E.** *A Study of the Development of the Recreation Workshop Movement.* M.A., 1950, Kent State University. 104 p. Library, Kent State University, Kent, Ohio.

Purpose: To present some idea of the amount of work that has been done in this field of organized recreation, and point out the great task that lies ahead in the development of recreation leaders.

Source of data: It was necessary to examine handbooks, programs, and the correspondence files between leaders of early institutes. Questionnaires, consultations and personal observations were also used.

Findings and conclusions: The "Recreation Workshop Movement" is a series of courses founded for the training of recreational leaders in order that they may share their skills in organized recreation. The recreation program must first provide: Fun and instill a love of play for itself; it should be based on an understanding of the natural interests of the age group; it should provide a distinct change from daily occupations. The Buckeye Recreational Workshop is a continuation of the Recreational Workshop Movement although its immediate origin was the Northeast Ohio Community Institute. The industrial arts instructor may easily qualify himself as a trained leader in the field of organized recreation.

305. **FOREMAN, RALPH S. (Masters).** *The Home Workshop.* Wayne University, 1946.

306. **HAGLUND, CARL I.** *Leisure Time Activities of Junior High School Pupils in Superior, Wisconsin, and the Industrial Arts Program.* M.A., 1941, University of Iowa. 141 p. Library, University of Iowa, Iowa City.

Purpose: To ascertain the leisure time activities of junior high school boys and girls that fit into the industrial arts program.

Source of Data: Data were obtained from a checklist administered to seventh, eighth, and ninth grade students in seven junior high schools in a Wisconsin city.

Findings and Conclusions: The industrial arts program contributes to worthy use of leisure time. Girls had an interest in beadwork and photography, while boys were interested in wood carving, gasoline motors, and fishing equipment.

307. **HEIDENREICH, HEINRICH (M.S.).** *A Survey of Extra-Curricular Activities of Industrial Arts Teachers in Arizona High Schools.* Oregon State College, 1942. 82 p.

A survey of the industrial arts teachers in Arizona which points up the problems arising from extra-curricular duties as well as from teaching subjects other than industrial arts.

308. HERZBERGER, ALFRED A. (Masters). *A Study of Industrial Activities in the Home.* Ohio State University, 1934.

309. HILL, ROBERT J. *A Study of the Significance for Vocational Prognosis of the Use Made by High School Boys of Their Leisure Time.* M.A., University of Michigan, 1942. 45 p.

An analysis of the leisure time activities of vocational school boys in order te determine, if possible, any relation to vocational choice.

310. HORST, CLAUDE WILLIAM (Masters). *A Study of the Leisure Time Preferences of Boys Attending a Part-time Vocational School.* University of Washington, 1933.

311. JACKSON, GEORGE C. *The Activity Program in the Horace Mann Junior High School of West Allis, Wisconsin.* M.S., 1950, The Stout Institute. 71 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To determine the interests of the boys in the Horace Mann Junior High School of West Allis, Wisconsin; and to determine the objectives of the school clubs and whether the clubs fit the student's interests.

Source of Data: A review of the literature; a questionnaire was given all of the boys in the school; a tabulation of the results to reveal their interests; an interview with each faculty club sponsor to make clear the objectives of each club.

Findings and Conclusions: Club programs occupy a definite place in a well-rounded school program since they help the student create and develop interests for the worthy use of his leisure time. Students at the junior high school level have wide and varied interests. They are active participants in the things they like to do. It is recommended that the club program in the Horace Mann Junior High School should be revised so that it may be more informal and flexible. The club sponsors should be only those who are interested in the program.

312. JESKE, WALTER H. (M.A.). *Incidence of Reading Interests of Shop Boys.* Wayne University, 1939. 105 p.

A study of one thousand boys' reading interests including such factors as: books and magazines read, order of reading interests, order of rating, time spent daily, and vocational reading.

313. KENAN, CLAUDE O. (Masters). *Home Shops of Junior High School Boys.* University of Oklahoma, 1930.

314. KING, JESSE WAYNE. *Short Courses in Industrial Arts for Their Hobby Value.* M.S., 1952, Oregon State College. 104 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the contributions that industrial arts courses might make toward the development of hobby interests for the worthy use of leisure time.

Source of Data: Data were secured from students, teachers, and others at the Northern Montana College.

Findings and Conclusions: Industrial arts courses offer many possibilities for the development of worthwhile hobbies. Hobbies are valuable to the individual who uses them. They are needed and desired by most people.

315. KITTLE, DEAN F. (M.S.). The *Activities and Equipment Found in the Home Workships of Sixty Boys in Lima, Ohio.* Iowa State College, 1935. 40 p.

A study to ascertain what was made in the boy's home workships; what machines he had and whether home-made or purchased; the father's occupation; sources from which the boy obtained plans or ideas for the articles made; and what magazines or books he read along such lines.

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316. LANDERS, FREDERICK W. (Doctors). *Pewter as Medium in Industrial Arts Education and Leisure Time Activities.* New York University, 1937.

317. MAGNESS, WILBUR CARNES (M.S.). *Selected Handcrafts for the High School Industrial Arts Instruction and the Home Shop Hobbyist.* Oregon State College, 1942. 152 p.

A study of handcrafts which includes teaching manuals for such hobby crafts as fishing tackle, leathercraft, and metalcraft. Thirty-nine pages of hand-drawn illustrative plates are included.

318. **MILLER, ELIZABETH F. (M.A.).** *Craft Work in Girls' Summer Camps.* Colorado State College of Education, 1947. 73 p.

A study of the types of craftwork suitable for girls' camps, aims of offering such work, and qualifications for teachers of crafts.

319. **MORGAN, JAY FRED.** *A Survey of the Extra-Curricular Activities Sponsored by Industrial Arts Teachers.* M.S. in Ind. Ed., Kansas State Teachers College, 1941. 16 p.

A description of the extra-curricular activities of industrial arts teachers in the small cities of Missouri.

320. **NELLIS, EARL W. (Masters).** *An Analysis of Boy Scout Projects and Practices; Suggestions for Industrial Arts Teachers.* Wayne University, 1945.

321. **OLSEN, KAY T. (M.S.).** *Development of a Home Workshop Club in Des Moines, Iowa.* Iowa State College, 1936. 67 p.

A study to show the history, organization, and activity of a home workshop club and to present facts concerning the shops of the members.

322. **PAGE, CAMERON L. (M.A.)** *A Survey of the Home Workshop in Ottumwa, Iowa.* Colorado State College of Education, 1941. 64 p.

A survey of the home workshops of Ottumwa, Iowa, to determine how the schools can be of aid to home workshop owners.

323. **PALMER, HAROLD S. (M.S.)** *Functions of the Industrial Arts Department in Establishing and Maintaining Home Workshops in Mason City, Iowa.* Iowa State College, 1936. 54. p.

A study to ascertain the boys' incentives for starting their shops, the type of shops the boys maintain, what projects the boys make in their shops, the amount of time the boys spend in their shops, and the manner in which the industrial arts department could be of service to the home shop program.

324. **PIERSON, GLENN ALFRED (Masters).** *A Study of the Outside Mechanical Activities and Interests of Boys at the Seventh, Eighth, and Ninth Grades.* Miami (Ohio), University, 1934.

325. **POPPENBERG, HENRY JOSEPH M.A.).** *A Survey of the Leisure Time Activities of Adults in Greeley, Colorado.* Colorado State College of Education, 1940. 118 p.

An analysis of the leisure time activities of the adults of Greeley, Colorado.

326. **POWELL, MARVIN A. (M.A.).** *A Survey of the Home Workshop Guild.* Colorado State College of Education, 1935. 101 p.

A comprehensive survey of home workshop owners as to age group, trade training, shop work taken in school, occupation of owner, shop location, cost, and other problems.

327. **PRATT, GUY A. (M.S.).** *A Study of the Hobbies to Meet the Interests of the Pupils in East Chicago, Indiana, and to Establish a Hobby Club Plan Including Organization Policies, Procedures, and Methods.* Colorado Agricultural & Mechanical College, 1937. 78 p.

A survey of the hobbies that are most desirable and feasible to meet the interests of the pupils in the high school of East Chicago, Indiana. A plan for establishing hobby clubs and operating them for the benefit of the members is included.

328. **RADCLIFF, GEORGE V.** *A Club in Industrial Arts.* M.Ed., 1949, Agricultural and Mechanical College of Texas. 30 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain the appropriateness and value of an industrial arts club to the program of industrial arts.

Source of Data: An industrial arts club was organized and its effects on the industrial arts program were observed.

Findings and Conclusions: An industrial arts club assisted the industrial arts program by broadening it, providing more activities, and improving the social adjustment in the industrial arts department.

329. RIDWAY, DALE D. *Extra-Curricular Activities in the Junior and Senior High Schools of Eastern Kansas Which Are Handled by Industrial Arts Teachers.* M.S. in Ind. Ed., Kansas State Teachers College, 1941. 25 p.

An account of the extra-curricular activities handled by industrial arts teachers in a group of small schools.

330. ROBINETTE, KELLEY FLOYD (M.S.). *A Study of Home Shops in Oregon in Relation to Certain Objectives of Secondary Education.* Oregon State College, 1936. 43 p.

A study of the existence of home shops in Oregon, the home repair jobs that are performed by the boys in those shops, and the role the industrial arts teacher should play in the students' leisure time training.

331. ROE, GEORGE S. *Avocational Activities of Professional Men in Relation to Industrial Arts.* M.S., in Ind. Ed., 1949, Kansas State Teachers College. 78 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To survey the avocational activities of professional men in Pittsburg, Kansas, and to determine to what extent these activities have contributed to their personal satisfactions, the improvement of their homes, and to their income in so far as they can be measured.

Source of Data: A personal survey was made of the professional men in Pittsburg, Kansas, who have home workshops; and photographs were taken to show evidence of the equipment and interest these men have in their work.

Findings and Conclusions: Making boats, pipes, furniture, metal objects, and building radios are only a few of the avocational activities engaged in by the men surveyed in this study. Physicians recommend that patients take up hobbies. Schools, according to professional men, should have better industrial arts equipment. The use of hand tools was stressed by several persons. "Industrial Arts is the subject that makes the man a better home owner." Estimates as to money saved by having a home workshop ranged from $50.00 to $4,000.00

332. RULE, PAUL HOPKINS (Masters). *Industrial Arts in Education for Leisure.* University of Washington, 1940. 136 p.

333. SMITH, VURL M. *Suggested Activities for Trade and Industrial Clubs in Oklahoma.* M.S., Oklahoma Agricultural and Mechanical College, 1948. 57 p.

An outline of club activities for sponsors of trade and industrial clubs.

334. SPRAGUE, WILLIAM A. (M.A.). *A Survey of the Home Workshops of High School Boys in Denver, Colorado.* Colorado State College of Education, 1946. 119 p.

A survey of the high school boys' home workshops in Denver, Colorado to determine how schools might help in meeting needs and problems of the boys.

335. STEINER, HAYDEN LEONARD (Masters). *Industrial Arts Clubs in the Schools of Central Ohio.* Ohio State University, 1933.

336. STEVENS, MARION P. *Industrial Arts Clubs and Their Activities in the State of Kansas.* M.S., in Ind. Ed., 1949, Kansas State Teachers College. 61 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To determine the number and kind of activities sponsored by clubs; the kind of activities sponsored by industrial arts teachers; the need for instruction helpful in organizing and sponsoring extra-curricular activities.

Source of Data: Analysis of literature on extra-curricular activities and the returns of a questionnaire sent to Kansas Schools.

Findings and Conclusions: Comparatively few industrial arts clubs are found in Kansas. Eighty-one percent of the teachers desired information about how to organize and sponsor a successful club. All students majoring in industrial arts should be active participating members of the department club.

337. TENNANT, STERLING (Masters). *Industrial Arts Exhibits at Junior Fairs.* Ohio State University, 1939.

338. WASMUTH, WALTER L. (M.S.). *A Study of the Reading Interests of Junior High School Boys in Industrial Arts Subjects in Lakewood,*

Ohio. The Stout Institute, 1943. 93 p.

A comparison of the expressed industrial arts interests of 690 junior high school boys with the library books they actually read. A guide for the selection of books that appeal to junior high school boys is included.

339. **WILCOX, PAUL V. (M.A.).** *Social and Economic Values Developed by the Home Workshop Movement.* Colorado Agricultural & Mechanical College, 1935. 115 p.

A suggested program for promoting the home workshop in Kansas City, Missouri, through the industrial arts.

340. **ZWEMER, AMANDA R.** *A Study of Leisure Time Activities of High School Students and Their Possible Relation to Vocational Choice.* M.A., University of Michigan, 1935. 66 p.

A study to determine what relationships exists between leisure time activities of senior high school students and their vocational choice.

Junior Colleges—Area Schools—Technical Institutes

341. **ABLES, JOE WARROCK.** *A Recommended Program of Industrial Education for Northeastern Oklahoma Agricultural and Mechanical College.* M.S., Oklahoma Agricultural and Mechanical College, 1947. 130 p.

A study of the several controlling philosophies relating to junior colleges, a survey of State-supported junior colleges in the United States, and a history of junior colleges in Oklahoma. A program of courses is proposed together with a floor plan of a shop and a list of the desired equipment.

342. **ALAIR, WILLIAM ROY.** *A Proposed Industrial Education Program for the Senior High School and Junior College, Dodge City, Kansas.* M.S. in Ind. Ed., Kansas State Teachers College, 1939. 142 p.

A proposed program of shop work and drafting for the junior college.

343. **ATTEBERRY, PAT HERMAN.** *The Status of Industrial Education in The Junior Colleges of The United States.* M.S. 1953, Kansas State Teachers College. 95 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To study the status of industrial arts and vocational industrial education in the junior colleges of the United States.

Source of Data: Data were obtained from current usable catalogs of 113 public and private junior colleges from twenty-eight states.

Findings and Conclusions: Thirty-eight typical industrial arts programs show that the teacher training and terminal objectives are generally combined. Woodworking is the most frequently offered field of instruction. Industrial arts majors average forty percent of their work in this field.

Fifty of the 113 schools offer vocational industrial education. Sixty-two percent of the work is given in this field.

A trend toward integration of vocational and general education is indicated.

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344. **BROOKING, WALTER JESSE (Ed.D.).** *A Critical Analysis of the Problems in Providing Vocational-Technical Education in Existing Institutions, Especially Junior Colleges.* University of Texas, 1948. 611 p.

A description of curriculum, program, faculty, administration, and equipment of a work-study pre-engineering collegiate institution and its implications for industrial education within junior colleges.

345. **CARLSON, ROBERT B.** *Terminal Technical Education in the Junior-College.* M.A., 1948, University of Minnesota. 108 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To ascertain the status of terminal education in the junior college curriculum.

Source of Data: Data were obtained from books and examination of junior college programs.

Findings and Conclusions: A description of terminal education as to its past and present status in junior colleges was developed.

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346. **COMBS, STANLEY LeQUATTE (Ed.D.).** *A Study of Terminal Vocational Students in Three California Public Junior Colleges; Implications*

for General Education. University of California at Los Angeles, 1948. 197 p.

A study of the characteristics and general trends of terminal education and its relationship to general education in the junior college curriculum. Statistics are given on age, health, church preference, work experience, family occupations, hobbies, family educational background, occupational aims, junior college majors, grades, and standardized test results.

347. DALY, JOSEPH T. (M.S.) ***An Investigation of Current Trends in the Terminal Curriculum of the Junior College.*** **University of Southern California, 1941. 100 p.**

A study of terminal curricula in junior colleges during the period 1932–1941, concluding that they have increased most rapidly in the vocational fields and more slowly in the cultural fields.

348. DAVIS, MAURICE WALTON (M.S.) ***The 1940 Status and Post War Outlook of Industrial Education in California Junior Colleges.*** **Oregon State College, 1947. 72 p.**

A study of forty-three junior colleges in an effort to determine the nature of the industrial education programs offered. Considers the teaching staff, shop size, hobby groups, and methods of handling occupational studies.

349. DIXON, HENRY A. (Masters). ***Organization and Development of Terminal-Occupational Curricula in Selected Junior Colleges.*** **Weber College, 1944.**

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350. ELLINGTON, MARK (Doctors). ***Determining the Professional Courses in a Technical Institute Curricula.*** **Ohio State University, 1936.**

351. FERMER, FRANK W. (M.A.). ***A Course of Study for Machine Shop on the Junior College Level.*** **Stanford University, 1948. 155 p.**

A course of study aimed to standardize machine shop instruction on the junior college level.

352. GIFFORD, GORDON E. (M.S. in Ed). ***The Development of a Suggested Curriculum in Commercial Refrigeration Installation and Service for State Technical Institutes.*** **Cornell University, 1945. 86 p.**

A brief analysis of refrigeration service work to serve as a basis for suggesting a curriculum in refrigeration service for use in technical institute programs in New York State.

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353. HALL, JAMES F. ***Principles and Policies of Technical Institute Education Including A Study of the Present Program at the Institute of Applied Arts and Sciences, New York City.*** **Ed.D., 1954, Columbia University. 210 p. Teachers College Library, Columbia University, New York.**

Purpose: **To examine the program of the New York Technical Institute with the history and evolution of post-high school technical education in the United States.**

Source of Data: **Data were obtained from a study of the organization of the Institution and other similar educational centers in the United States.**

Findings and Conclusions: **The Institute is making a valuable contribution today and can do even more in the future. This substantiates the philosophy that the technical program in New York State will never fail to meet the challenges and needs of a changing industrial society.**

354. HEISLER, W. FRED. ***Post High School Trade and Technical Training.*** **M.S., Oklahoma Agricultural and Mechanical College, 1935. 93 p.**

A proposed program for a technical institute in Oklahoma based on a survey of needs.

355. HERR, CHARLES R. (M.S.). ***Determining a Junior College Curriculum for Plane Surveying and Civil Technology Based on a Study of Employers' Specifications.*** **University of Southern California, 1938. 64 p.**

A study attempting to solve a curriculum problem by applying to the proposed courses suggestions from prospective employers about needs of employers in the stated fields.

356. KAISER, JOHN M. (M.S.). ***A Study of 489 Veterans Attending the Williamsport Technical Institute: Their Backgrounds, Vocational Choices, and Their Recommenda-***

tions for Improving the Program. **Pennsylvania State College, 1946. 44 p.**

A study of the veterans attending the Williamsport Technical Institute in 1945–46, including a description of their backgrounds, vocational choices, and recommendations for improving the program.

357. KOMATZ, PAUL A. ***Interrelationship of Industrial Arts and Farm Mechanics with Specific Application to Parsons Junior College, Parsons, Kansas.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1948. 38 p.**

A proposal for combining industrial arts and farm mechanics in one shop.

358. LARSON, RAYMOND H. ***Occupational Offerings in the Public Junior Colleges of Minnesota.*** **M.A., University of Minnesota, 1939. 82 p.**

A study of the curricula of Minnesota junior colleges with particular reference to industrial education and the possibility of integrating them with the 4-year curriculum for teacher training at the University of Minnesota.

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359. LEAN, ARTHUR EDWARD. ***The Organization of Post High School Education in Flint, Michigan.*** **Ph.D., University of Michigan, 1948. 184 p.**

A socio-educational study emphasizing enrollment and curricular aspects of post high school education in the city of Flint and Genesee County. Considers preparatory and terminal needs as well as general education for older youth and adults.

360. MASON, WILLIAM RONALD (Masters). ***The Development of Technical Training in the Public Schools of Cleveland, Ohio.*** **University of Chicago, 1936.**

361. McLEOD, PAT N. ***Industrial Arts Programs in the Junior Colleges of Texas.*** **M.S., 1952, North Texas State College. 60 p. Library, North Texas State College, Denton.**

Purpose: To trace the development of the industrial arts program in the junior colleges of Texas, with special reference to purpose, instructional staff, facilities, and curriculum content.

Source of Data: Data were secured from books, magazines, college bulletins, interviews, and a questionnaire.

Findings and Conclusions: Thirty-three of the fifty junior colleges in Texas include one or more phases of industrial arts. The number of courses offered ranged from one to twenty-two. The majority of the instructors had completed a Master's degree and had public school teaching experience.

362. MUELKE, HERMAN G. (Masters). ***A Study of Technical Curriculum Extension from Secondary to a Junior College Level.*** **University of Buffalo, 1936.**

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363. MURBACH, NELSON JACOB. ***The Development of Area Vocational School Programs in New York State.*** **Ed.D., 1949, New York University. 284 p. Library, New York University, New York and Library of Congress.**

Purpose: To survey the need for the creation of area vocational schools in New York State.

Source of Data: Survey of needs, potentialities, legislation, and administrative agencies required pertinent to the problem. Data secured by information gathered concerning existing area vocational schools, study of all existing written material plus the gathering of more by personal visitations, correspondence, library research and first hand information.

Findings and Conclusions: Definite recommendations are made for the development of such a program as the following: A State plan offered, united leadership among State and local officials, more financial aid in the development of area vocational schools programs on the high school level, the combining of small localities for the establishment of such schools, larger area schools offering courses for surrounding localities.

364. NEVALDINE, PETER. ***A Study of the Need for Granting Associate Degrees to Graduates of Technical Institutes.*** **M.S. in Ed., 1948, Cornell University. 102 p. Library, New York State School of Industrial and**

Labor Relations, Cornell University, Ithaca.

Purpose: To determine what type of recognition to award to graduates of post high school institutions, junior colleges, community colleges, and specifically technical institutes.

Source of Data: A questionnaire containing 24 questions was sent to all the graduates of the industrial department of the Agricultural and Technical Institute in Canton, New York.

Findings and Conclusions: It is recommended that technical institutes be permitted to grant associate degrees on the basis that most of the graduates contacted in this study felt that such degrees would have very definite prestige values; technical institutes be required to meet minimum standards and be credited by a recognized accrediting agency before being authorized to grant such degrees; the State Education Department initiate more active publicity program to publicize technical institute education in high schools and to prospective employers.

365. NOTAR, ERNEST (M.Ed.). ***A Proposed Program of Vocational-Technical Education on a Post Secondary Level for the Niagara Frontier.*** **University of Buffalo, 1946. 120 p.**

A study of the need for technical institute education, together with a suggested building construction curriculum for such an institute.

366. OTTOSON, GERALD E. ***The Utilization of Manpower in the Technical Institutes of New York State.*** **M.S. in Ed., 1949, Cornell University. 118 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: To investigate the educational and vocational background of the facilities of the 11 technical institutes of New York State. To investigate the number of teacher hours spent in class activities per student; in each institute, in each curriculum, and technical and foundation courses. To analyze the instructor load by professional rankings. To analyze extra-curricular duties which are assigned to faculty members.

Source of Data: Source of data was a questionnaire sent to 531 instructional staff members and 23 technical assistants of institute staff in New York State.

Findings and Conclusions: Educational requirements are not being met by some faculty members. Teachers with adequate industrial or business experience are relatively easy to find. The combination of work experience and educational requirements is difficult to obtain. A cause for immediate attention is the fact that technical subjects are requiring 3½ times as much teacher time as are the foundation courses.

367. RANDEL, STEPHEN VINCENT (M.S.) ***Development of Industrial Arts and Vocational Education in the Junior Colleges of Mississippi.*** **A & M College of Texas, 1947. 151 p.**

Describes the origin and development of industrial and vocational education in the junior colleges of Mississippi from 1930 to 1947, and offers suggestions for improving the program.

368. RONEY, MAURICE W. ***How the Technical Institute Meets the Needs of Its Students.*** **M.S., 1952, Oklahoma Agricultural and Mechanical College. 76 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To ascertain the value of technical institute training in our educational system, and the factors important to the individual who is considering specialized technical education beyond the high school level.

Source of Data: Data were obtained from a survey of industrial organizations in the state of Oklahoma and from a follow-up study of graduates of technical institutes.

Findings and Conclusions: Industry has an urgent need for personnel with two years of college level technical training. A majority of the industrial organizations of the state are using engineering graduates to perform technician duties. Of the technical institute graduates whose records were available for this study, 72.5 per cent were employed in their field of specialized training.

369. SHEPHERD, REGINALD W. (M.A.). ***Vocational Education in the New York State Technical Institutes and the California Public Junior Colleges.*** **Stanford University, 1948. 198 p.**

A study to determine the scope of terminal vocational education as well as the adequacy of serving the needs of the community and the individual.

370. STAMPS, BILLY J. ***The Teaching of Industrial Education in the Junior College.*** **M.S., 1950, East Texas State Teachers College. 87 p. Library, East Texas State Teachers College, Commerce.**

Purpose: **To compare the ancient apprenticeship method of teaching a trade with the modern method of teaching trade subjects in the schools.**

Source of Data: **Information obtained from reference material, including books, publications of learned organizations, encyclopedia articles, and unpublished articles.**

Findings and Conclusions: **Industrial education can be taught as effectively in the school as any other subject. Industrial education produces results comparable to the caliber of students. Industry wants the school to develop good work habits, promptnes, pride in a job well done, and cooperation.**

371. STEWART, PRESTON ELLIOTT, Sr. ***A Study of the Vocational Technical Training Program At Tennessee Agricultural and Industrial State College.*** **M.S., 1951, Tennessee Agricultural and Industrial State College. 45 p. Library, Tennessee Agricultural and Industrial State College, Nashville.**

Purpose: **To analyze the vocational technical training program of Tennessee Agricultural and Industrial State College and compare it with similar programs offered in other schools.**

Source of Data: **Data were secured through catalogs of other schools, questionnaires to graduates and instructors of the college.**

Findings and Conclusions **The offerings in vocational technical training at Tennessee Agricultural and Industrial State College were greater in number than in other schools studied, were less technical in nature, placed more emphasis on the development of skill, and did not meet accreditation requirements for technical courses. The program had met a need as shown by the number employed in the fields for which they had been trained.**

372. STRATE, JOHN PAUL. ***Industrial Arts and Non-Reimbursed Industrial Education in California Junior College Districts of Fewer Than One Thousand Students.*** **M.A. 1954, Fresno State College. 117 p. Division of Fine and Practical Arts, Fresno State College, Fresno, California.**

Purpose: **To ascertain the status of industrial arts and non-reimbursed industrial education in certain California junior colleges.**

Source of Data: **Data were obtained by visiting the institutions and by personal interviews with teachers and administrators.**

Findings and Conclusions: **Junior college industrial programs seem to be expanding. There is considerable discrepancy between junior college catalog representations of industrial programs and actual course offerings. Two-thirds of the existing courses in the junior colleges studied are of the non-reimbursable type. The three most popular non-reimbursed junior college offerings are drafting, auto mechanics, and machine shop. In over half of all non-reimbursed industrial courses, high school and junior college classes share the shop facilities, and in more than one-third of the courses, high school and junior college students are combined in the same classes.**

373. TRUEBLOOD, FRANK S. (M.S.). ***A Survey and Evaluation of Aeronautics Instruction in California Junior Colleges.*** **University of Southern California, 1935. 94 p.**

A study of curriculum and course content of aeronautics courses in junior colleges of California to determine the extent to which they are offered and the level on which they are taught.

374. WICK, SVERRE K. ***A Machine Shop Course for Junior Colleges.*** **M.S., Iowa State College, 1938.**

A study of engineering machine shop practice in five institutions coupled with research on engineering on the semi-professional level.

375. WILSON, CARL S. (Masters). ***A Job Opportunity Survey of Lincoln County, Mississippi with Special Reference to the Needs of Junior College Students.*** **Louisiana State University, 1939.**

376. WRAHLSTAD, JEROME G. (M.S.). ***Survey of the Industrial Arts Courses Offered in Public Junior Colleges of the Middle West and a Proposed Curriculum.*** **Iowa State College, 1936. 73 p.**

A survey of amount of industrial arts offered and the type and scope of the courses offered in the junior colleges of the Middle West. A curriculum suitable for the average junior college of 150 students was constructed.

Legislation, Federal and State

377. BACH, HAROLD H. (M.A.). *Legal Responsibilities of Boards of Education for School Accidents.* The Ohio State University, 1933. 144 p.

A consideration of the legal implications which confront Boards of Education, including their responsibilities, their practices, and the legal problems involving school accidents in industrial arts shops. Accident prevention measures are suggested.

378. BEAWDRY, CLAYTON J. (M.S.). *A Study of the Legal Provisions for Special Education in the Forty-Eight States of the United States.* North Texas State, 1948. 54 p.

An analysis of the laws of Texas and other states with regard to special education up to 1948. The inadequacy of the present educational program for the handicapped is noted and the need for specially trained teachers and special schools is stressed.

379. CONLEY, CONRAD A. (M.A.). *Provisions of Congressional Acts for Vocational Educational Services.* University of Florida, 1945. 96 p.

An historical study of Federal aid to vocational education. This review of Congressional legislation indicates that the Federal Government has not lost sight of state sovereignty in recognizing the need for aiding educational pursuits.

380. CULBERTSON, ARLEY B. *Liability With Reference To Teachers in Industrial Education For Damages Resulting From Injuries to Pupils Under Their Supervision.* M.S., 1954, Kansas State Teachers College. 121 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

***Purpose:* To ascertain the liability of industrial education teachers for damages resulting from injuries to their students.**

***Source of Data:* Data were obtained from a questionnaire and literature.**

***Findings and Conclusions:* Only five states have legislation in which the industrial education teacher is protected. Liability depends upon proof of negligence. Purchase of insurance policies is considered and safety practices for shop operation are discussed.**

381. ELVIN, ALEXANDER. *The Application of the Wheeler-Howard Act to the Educational, Occupational and Social Programs of the Phoenix Indian High School.* M.S., Colorado Agricultural and Mechanical College, 1939. 84 p.

This report deals with the background of thinking and events that led to the passage of the Wheeler-Howard Act and the subsequent problems that have arisen when Indian School officials have attempted to apply the provisions of this act to the educational, occupational, and social programs at the Phoenix Indian High School.

382. FOSTER, MILTON MORRIS. *The Applications of Tort Liability Affecting the Teaching of Industrial Arts Courses.* M.S., 1952, Oregon State College. 83 p. Library, Oregon State College, Corvallis.

***Purpose:* To show the need for measures to protect teachers and administrators from financial liability in case of school shop accidents.**

***Source of Data:* Data were secured through a study of tort liability and "National Reporters".**

***Findings and Conclusions:* With the exceptions of three states in which legislative statute has made provision for some relief, the only alternative for the injured student to receive compensatory damages for injury in the school shop is through actions against individual teachers, administrators, and school board members.**

383. GILKER, HAL. *Trade and Industrial Education in Minnesota.* M.A., University of Minnesota, 1936. 33 p.

Review of Federal laws in aid of vocational education of less-than-college grade, enrollment advance in Minnesota, and comparison with certain other States.

384. GOODWIN, JOHN BOYLE (M.S.). *The Status of Industrial Arts Teachers on Accident Compensation (Survey of States).* Oregon State College, 1942. 80 p.

An analysis of the laws of thirty-one states to point out the states which provide accident compensation for shop teachers. A summary of the findings in tabular form is included.

385. **KAMENY, SAMUEL S. (Masters).** ***A Study of Legislation Pertaining to Vocational Education Enacted in the State of New York from 1917 through 1929.*** **City College, New York, 1931.**

386. **KIESEWETTER, RICHARD J. (M.A.).** ***Smith-Hughes Act in California.*** **Stanford University, 1947. 138 p.**

An analysis of the original Smith-Hughes Act (1917) and amendments to determine the advisability of Federal support for education in specific areas.

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387. **KING, HOMER PARNELL (Ed.D.).** ***A History of Federal Legislation Relating to Sub-Collegiate Vocational Education from 1900–1933.*** **University of Southern California, 1934.**

Covers Federal legislation from 1900–1933 and outlines in considerable detail the progress of the major and minor bills concerning vocational education.

388. **LOWE, WARREN JAMES.** ***Traffic Laws of the North-Central States Bearing on Driver Education.*** **M.S., 1952, Illinois State Normal University. 39 p. Library, Illinois State Normal University, Normal.**

Purpose: To ascertain the traffic laws of the north-central states which bear on driver-education instruction in the high school.

Source of Data: Data were obtained by letters sent to the traffic-division headquarters of the states included, requesting information concerning traffic laws and driver-licensing requirements.

Findings and Conclusions: The report gives brief summaries of the laws together with their variations from state to state.

389. **MERAN, ROBERT D.** ***Analysis of State and Federal Legislation for Vocational Education, 1895–1917.*** **M.A., 1951, The Ohio State University. 86 p. Library, The Ohio State University, Columbus.**

Purposes: To analyse and review the congressional proposals for vocational education before 1917.

Source of Data: Data were obtained from proposed and enacted legislation at state and federal levels and from documents of organizations sponsoring or opposing federal aid for vocational education.

Findings and Conclusions: The Smith-Hughes law represents a concensus of the provisions of similar proposals dating back to 1906 and the needs, wants, and efforts of educators, employers, and employees, education, civic, industrial, agricultural, and commercial organizations throughout the nation. Techniques used to obtain the enactment of the Smith-Hughes law were community surveys, development of favorable public opinion, urging groups to cooperate, selecting men to promote bills in congress, and keeping the bill before the legislators.

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390. **MILLER L. PAUL (Ph.D.).** ***State Regulation of Entrance Into Occupation in the State of New York. A Study of State Legislation in the State of New York Which Has Placed Requirements of Personal Qualifications Upon Individuals For Legal Entrance Into Certain Occupations in the State.*** **New York University, School of Education, 1939. 315 p.**

A study of the legal requirements and adaptation of law to the registration and certification of occupations and professions for the protection of the public and the regulation of certain trades and professions in New York State.

391. **MOREAU, HARRIS P. (Masters).** ***The History of Federal Participation in Vocational Education up to World War II.*** **Wayne University, 1943.**

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392. **MORGAN, JACK WARD.** ***Factors Influencing The Passage of Federal Legislation For Vocational Education.*** **Ed.D. 1951, University of Missouri. 363 p. Library, University of Missouri, Columbia.**

Purpose: To ascertain the economic-social-philosophical factors that have influenced the enactment of federally aided programs of vocational education of less than college grade in the public schools.

Source of Data: Primary data were secured from the proceedings of conventions of the National Education Association, National Association of Manufacturers, American Federation of Labor, National Society for the Promition of Industrial Education, Congress in session, and reports of state commissions on industrial education. Secondary data were secured from official publications of these organizations, other current publications and books pertinent to the subject.

Findings and Conclusions: The initial movement for vocational education came about as an attempt to provide an education better suited to the needs of the masses of boys and girls. The most persistent force promoting the Smith-Hughes Act was the National Society for the Promotion of Industrial Education. One of the most important factors precipitating a demand for vocational education was the popularity of mechanistic psychology. An essential factor in obtaining Federal legislation is the presence of strong and vigorous leadership on the part of influential senators and congressmen. Since its formation in 1926, the American Vocational Association has been the driving and organizing force behind movements to further develop the program of federal aid for vocational education. Early bills passed by Congress tended to be simple, specific, and provided a minimum appropriation. Subsequent laws gradually broadened the scope and increased the funds available to the states. Attempts to further develop the program of vocational education have usually been during periods of national emergency or economic and social crises. Congress, for the most part, has been satisfied with the results of federally aided vocational education and friendly toward proposals for its further development.

393. MUELLER, ELMER ARTHUR. *A Survey of Minnesota Private Trade and Correspondence School Laws: Their Background and Administration from 1943 through 1953.* **M.A., 1954, University of Minnesota. 110 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To survey and record information about Minnesota's private trade and correspondence school laws, the conditions which lead to their passage, the administration of the laws, and the courses and institutions affected by them.

Source of Data: Data were obtained by a survey of the literature in the field of private trade and correspondence school operation, the files and records of the Private Trade School Division of the Minnesota Department of Education, and the experience of the State Supervisor of Private Trade Schools over a period of ten years.

Findings and Conclusions: The study shows that exploitation of trainees by private for-profit trade and correspondence schools led to the passage of licensing legislation in Minnesota (1943) for the control of profiteering and unethical institutions and their agents. Minnesota trade and correspondence school statutes need to be strengthened so that private for-profit schools offering training in business subjects, medical laboratory technique, practical nursing and correspondence courses would be subject to licensure and control for the protection of trainees.

394. PEREGRINE, DONALD (M.S.). *The Legal Liability of Public School Officials in Civil Actions.* **Purdue University, 1936. 62 p.**

An historical study of the legal liability of public school officials according to Indiana law. Liability for shop injuries and the inadequacies of the existing law are considered.

395. PIILO, HERBERT EINER. *Teacher Liability in Michigan for Student Injuries in School Shops.* **M.Ed., 1950, Wayne University. 30 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To ascertain the legal responsibility of shop teachers in the event of accidents within school shops.

Source of Data: Data were obtained from studies carried on in other states and existing statutes and court decisions in Michigan.

Findings and Conclusions: Forty-four states do not admit liability, leaving the possibility to the teacher being sued for liability if negligence can be proved. Certain precautionary measures and forms of proof are recommended to protect the individual teacher who must operate under these conditions.

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396. PINCKNEY, CHARLES WHITNER. *Liabilities of Shop Teachers and School Districts for Pupil Injuries in School Shops Resulting in Court Cases in the United States.* **Ed.D., 1953, The Pennsylvania State University. 80 p. Library, The Pennsylvania State University, University Park.**

Purpose: To investigate the legal liabilities of shop teachers and school districts for pupil injuries in school shops.

Source of Data: Data were obtained by the method of legal research.

Findings and Conclusions: Only five states in the U. S. have statutory provisions that have been judicially interpreted to impose liability upon school districts to pay claims or judgments in lawsuits seeking recovery for pupil injuries in public schools. School districts were named defendants in twenty cases found in the study; shop teachers were named defendants in three cases. School districts and shop teachers were named co-defendants in eleven cases. In sixteen cases damages were awarded to plaintiff for his injuries. The extent of plaintiff's injury influenced the amount of damages recoverable, irrespective of equipment or activity that caused the injury. Alleged violation of safe place statutes appeared more frequently as grounds for action against school districts. Failure to properly inspect and repair equipment was second highest complaint. There has been no significant change in common law principles or interpretation that have affected the liability of either school districts or shop teachers from 1920 to 1952.

397. RESH, MARY SHERMAN (M.A.). ***Antecedents of the Smith-Hughes Act (1862–1917).*** **George Washington University, 1939. 215 p.**

An historical development of industrial education in the United States (1862–1917) with interpretations of some of the factors which brought about Federal aid to vocational education.

398. SANDLIP, ROSCOE NELSON (M.A.) ***Federal-State Co-operation in Vocational Education in Texas.*** **University of Texas, 1941. 71 p.**

An analysis of state and federal laws and policies relating to the organization and administration of vocational education in Texas, from 1862 to 1940.

399. STAMPER, CHARLES E. ***Development in Federal Support of Education in the United States Since 1930.*** **M.Ed., University of Cincinnati, 1948. 91 p.**

A study to present evidence of a definite need for Federal support of education.

400. SHABER, CECIL R. ***Fire Protection of Buildings, Construction and Occupancy.*** **M.S., Oklahoma Agricultural and Mechanical College, 1948. 91 p.**

A study attempting to draw together material from legal and quasi-legal sources to provide a guide in the inspection of buildins for fire protection, construction, and occupancy.

401. WALL, GUSTAVE A. ***Part-Time Education Laws.*** **M.A., 1937, University of Minnesota. 77 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To present a cross section picture of the Part-Time Educational Laws of the 48 states, with reviews of the compulsory details of the laws and rulings of 26 states.

Source of Data: Data were obtained from an examination of material published by the States and Federal Departments of Education.

Findings and Conclusions: Twenty-six states have compulsory part-time education laws. Most states require part-time classes be held between 8 : 00 a. m. and 5 : 00 p. m. Thirteen states require a minimum of 4 hours of instruction per week. Forty-three states place responsibility on the parents or guardians for school attendance of eligible minors. Attendance officers of school districts enforce attendance regulations. Fourteen states require that time in school plus the time at work not exceed the total hours of work permitted by law per week for such youth. The minimum age in all states is 16 years.

Private Trade Schools

402. ALLDREAD, CARLYLE H. ***Survey of Private Trade Schools in Michigan Offering Courses in Industrial Education.*** **M.Ed., 1949, Wayne University. 139 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To examine the private trade schools in Michigan.

Source of Data: Data were obtained from periodicals, the Michigan State Department of Public Instruction, and a survey of selected private trade schools in Michigan.

Findings and Conclusions: Most private trade schools in Michigan are doing a good job and are offering courses which are considerably more current than those offered in our public schools. Private trade schools use more up-to-date equipment than most of our public schools.

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403. BIBB, HERMAN LEON. ***Private Trade Schools Operating in Missouri From 1944 Through 1951.*** **Ed.D., 1952, University of Missouri. 210 p. Library, University of Missouri, Columbia.***

Purpose: To survey the private trade schools of Missouri approved for veteran training, for the period 1944 through 1951.

Source of Data: Data for the study were secured from records on file in the office of the Veterans' and Adult Education Section, State Department of Education, Jefferson City, Missouri, from information blanks sent to graduates of private trade schools and the employers of graduates, and from the House Select Committee Report, House of Representatives, 81st Congress, 2nd Session.

Findings and Conclusions: Fifty-five private trade schools operated in Missouri from 1944 through 1951, enrolling predominantly veterans of World War II. These trade schools had many shortcomings, some stemming from profit motive and others from sudden expansion of new and old schools. Some unqualified schools were granted approvals for operation, though with development and application of standards for approval, the qualifications of private trade schools improved. The private trade schools did not always have consideration for the supply and demand for trained workers in some of the trades. It appeared that the training provided by the private trade schools during the period from 1944 through 1951 was costly to individuals and to taxpayers. However, the placement of private trade school graduates in jobs for which they were trained appeared high. The occupational success of these graduates who were employed in the trade for which they were trained compared favorably with other employees who had been in similar trades for approximately the same length of time.

404. **BISHOP, MYRON C.** (Masters), *Industrial Arts in the Y. M. C. A. Programs.* Ohio State University, 1938.

405. **CRIBBEN, LEO T.** (Masters), *A Study of Certain Private and Endowed Schools Offering Trade and Industrial Education in New York State.* New York University, 1930.

406. **DuPONT, DOROTHY A.** (M.Ed.) *A Study of Private Vocational Schools in Philadelphia, Pennsylvania.* Temple University, 1937. 150 p.

Data on entrance requirements, costs, length of sessions, administration, placement, and other factors were obtained from fifty-five private vocational schools by questionnaire or personal visit, or both. The schools were those operating at the close of 1936 and were offering training in thirty-eight different vocations.

407. **NECHANICKY, BLANCHE B.** (M.S. in Ed.). *The Status of Private Trade School Education for Girls and Women in New York State.* Cornell University, 1945. 207 p.

A study of offerings of trade schools for girls and women in New York State, complete with extensive tables and list of figures, plus teaching procedures, trainees' work, equipment, shops, and materials used in those schools operating as of December 31, 1941.

408. **RICHARDS, PAUL EASTMAN** (M.A.). *An Industrial Arts Program for a Private Junior-Senior High School.* Stanford University, 1933. 228 p.

A survey of the program of studies of private schools in the United States. Trends concerning industrial arts programs are indicated, and recommendations are offered.

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409. **SCHURE, ALEXANDER.** *The Private Trade School in New York State, 1952: A Proposed Accreditation Program for the Private Profit Proprietary Trade School.* Ed. D., 1953, New York University. 544 p. Library, New York University, New York.*

Purpose: To investigate the status of private proprietary trade schools within New York State and to formulate a working program for the accreditation and educational upgrading of such schools.

Source of Data: A study was made of the New York State Laws and Regulations controlling private trade schools and of the factors in the Veterans Readjustment Assistance Act of 1952 that affect these schools. Data were taken from the files of the appropriate agencies. A number of typical schools in New York State were studied.

Findings and Conclusions: In terms of the developed needs of the proprietary trade schools, recommendations were made for a possible approach to the accreditation or upgrading of these schools. These included a proposal to utilize the Bureau of Private Trade Schools of the New York State Education Department as an accrediting agency, it being shown that this agency met all of the developed requirements.

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410. **SCHURE, ALEXANDER.** *The Private Trade School in New York State, 1937–1949,* Ph.D., 1950, New York University. 334 p. Library, New York University, New York.*

Purpose: To present a historical analysis of the private proprietary trade schools within New York State so as to give a comprehensive, cogent picture of the purposes, operations, and functions of these schools, and to identify observable trends in the development of such schools.

Source of Data: Data were obtained from buletins of information, directives, regulations, and other pertinent material pertaining to New York State. The data were developed for qualitative relationships by analysis and tabular treatment.

Findings and Conclusions: The proprietary trade schools in New York State grew tremendously as a result of the impetus of legislation affecting World War II veterans. Efforts to curb abuses in the training program caused a considerable increase in the regulation and supervision of these schools. Although the schools themselves will shrink as the World War II program terminates, the restrictions tend to remain.

411. TROYER, HERBERT R. (Masters). ***Opportunities for Special Education in Ohio: A Study of Private Vocational Schools Below College Level.*** **Ohio State University, 1933.**

Findings and Conclusions: The program proposed by the writer offers several areas from which to choose a vocation and at the same time develop better trained individuals capable of adjusting themselves into society.

Program Planning

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412. ADAMS, ORVILLE D. ***A Plan for Vocational Education in San Francisco,*** **Ed.D., 1952, Stanford University. 250 p. Library, Stanford University, Stanford, California.**

Purpose: To ascertain the need for trained workers in San Francisco, and to analyze existing educational facilities and project future needs.

Source of Data: Data were obtained from a study of the development of vocational education in San Francisco from its inception to the present time, a study of the U. S. Census, a community occupational survey, and other statistical material.

Findings and Conclusions: San Francisco had a comparatively adequate comprehensive terminal program of vocational education at time of study. The program of industrial arts, of trade and industrial education, and of distributive education need to be expanded. The placement function needs to be centralized. Business education needs coordination and correlation of activity. Flexibility in the terminal training program needs to be maintained. The homemaking program needs to be expanded. Certain physical facilities need to be rebuilt and renovated.

413. ALLEN, CARNIE E. ***An Industrial Education Program for Sam Houston Elementary and Secondary Schools.*** **M.S., 1952, Prairie View Agricultural and Mechanical College. 42 p. Library, Prairie View Agriculture and Mechanical College, Prairie, View, Texas.**

Purpose: To propose an industrial education program for Sam Houston School, Huntsville, Texas.

Source of Data: Data were obtained from literature, interviews, and visitation.

414. ALLISON, A. VERNON. ***Industrial Education at Hesston College, Analysis and Projection of a Program.*** **M.S., 1951, Kansas State Teachers College. 82 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To examine the industrial education program at Hesston College with the view of projecting a program into the future in keeping with need and demand.

Source of Data: Data were obtained from a questionnaire given to students to ascertain their preferences, and to selected individuals of the communuity. Other colleges of similar size and breadth of offering were surveyed to ascertain their offerings in industrial education.

Findings and Conclusions: A proposal for program projection was made and includes work, both shop and related information, in the following areas: auto mechanics, building trades, drafting, electricity, farm mechanics, welding, comprehensive general shop, home mechanics, and adult education.

415. ANDERSON, HERBERT CHARLES. ***Vocational Education and the Needs of Youth.*** **M.A., Claremont Colleges, 1948. 150 p.**

A study to make educational leaders in the secondary field aware of the values resulting from a well-integrated vocational education program. This study should prove instructive to those interested in the establishment of technical high schools, junior colleges, or trade classes in the regular high schools.

416. **ANDERSON, LIPSCOMB (M.S.).** *A Proposed Program of Vocational Education and Industrial Arts for the City of San Angelo, Texas.* A. & M. College of Texas, 1940. 45 p.

A survey of occupations and school records of San Angelo, Texas, as of 1939–1940, as a basis for formulating an industrial arts and vocational education program fitted to the occupational needs of the community.

417. **BARNDT, F. ROSS.** *Converting an Industrial Arts Unit Shop Into a General Farm Shop for District 3B of the Welda Rural High School.* M.S., 1952, Kansas State Teachers College. 55 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To reorganize a unit industrial arts wood shop into a general farm shop in terms of the needs of students in the community.

Source of Data: Data were obtained from questionnaires filled out by fifty-four parents and sixty-six farmers in the area.

Findings and Conclusions: A basic course of study was established which includes the areas of: welding, electricity, glazing, soldering, home farm shop, painting, leather work, rope work, tool sharpening, concrete, plumbing, and woodwork.

418. **BIRNBAUM, ELIOT (M.S.).** *Contributions which Industrial Arts Courses on the High School Level May Make to Community Planning.* Syracuse University, 1948. 148 p.

A description of a proposal to integrate a course in community planning with industrial arts courses. Includes bibliographical material as well as suggestions regarding the use of sensory aids to planning.

419. **BLACK, RAYMOND EUGENE (M.A.).** *A Vocational Training Program for the Rockport Public Schools.* The University of Texas, 1940. 110 p.

An analysis of vocational training in the local schools, 1936 to 1940, and a survey of 107 industrial establishments of Rockport with respect to employment possibilities for high school graduates. A training program is proposed in terms of the employment opportunities for secondary school youth.

420. **BOAZ, TED.** *A Proposed Industrial Education Curriculum for Del Mar College in Corpus Christi, Texas.* M.Ed., 1951, Agricultural and Mechanical College of Texas. 51 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To organize a program in Industrial Education, to provide two years of training for students majoring in this field, and two years of training for terminal students who plan to work in industry upon graduation.

Source of Data: Data were obtained from books, encyclopedias, bulletins, and catalogs.

Findings and Conclusions: Training should be offered to students who plan to teach industrial arts in the public schools after completing the degree requirements of a four year college or university. The curriculum should be flexible enough to meet the requirements of those who desire industrial employment after graduation from the junior or senior college.

421. **BODDIFORD, JOSEPH KNAPP (M.A.).** *Industrial Arts in a Community Centered Program.* Ohio State University, 1939, 129 p.

An attempt to determine the value of the industrial arts laboratory and the school as a community center. The author develops this concept through chapters on the application to elementary, secondary school, out-of-school, and adult groups. Particular attention is given to the social value of such a program in a rural school.

422. **BONHAM, WILBUR E. (M.S.).** *A Survey of Industrial Education in the Masonic Homes of the United States and A Proposed Program of Industrial Education for the Oklahoma Masonic Home.* Oklahoma A. & M. College, 1936. 73 p.

A review of the history and status of industrial arts in Masonic homes in the United States in 1936, with a proposed industrial arts program for the Masonic Home in Oklahoma.

423. **BORDNER, ARMAR J. (M.Ed.).** *A Proposed Industrial Arts Program for the Junior High School Grades in Lebanon County, Pennsylvania.* Pennsylvania State College, 1936. 107 p.

A study of the history, aims, objectives, and methods of teaching industrial arts. A program of industrial arts for the junior high schools in Lebanon County, Pennsylvania, is developed.

424. BRINSON, LEWIS INMAN. *An Arts and Crafts Program for the City of Fitzgerald, Georgia, As a Part of the Extended School Program.* M. of I.A., 1954, North Carolina State College. 34 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the type of arts and crafts program needed for the city of Fitzgerald, Georgia, as a part of the extended school program.

Source of Data: Data were secured from the reports of the eighty-four schools participating in Georgia's extended school program and a community survey.

Findings and Conclusions: A carefully planned program of arts and crafts for Fitzgerald, Georgia, designed to fit into the extended school program of Georgia was the result of this study.

425. BROWN, ROBERT DEAN. *A Four-Area, Seventh and Eighth Grade Industrial Arts Program for Glendive, Montana.* M.A., 1952, University of Minnesota. 248 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide the Glendive, Montana, Junior High School with a wisely conceived and soundly constructed industrial arts curriculum.

Source of Data: Data were obtained from literature of the field, local school officials, interested local lay persons, and the author's experience as an industrial arts teacher.

Findings and Conclusions: The program developed consists of semester courses in mechanical drawing, craftwork, woodwork, and electricity plus introductory material, a characterization of industrial arts objectives, and teaching materials.

426. BUFORD, JOHN EZELL (M.A.). *The Revised Vocational Curriculum for Washington High School in Sand Springs, Oklahoma.* Colorado State College of Education, 1938. 65 p.

The organization of a vocational curriculum based on needs of potential employers of Negroes. Reorganized courses were evaluated by Negro colleges which students of the school planned to attend.

427. BURNETTE, GLENN E. (M.S.). *A Plan for Reorganizing the Industrial Arts Program of the Great Bend, Kansas, Public Schools.* Colorado Agricultural & Mechanical College, 1941. 54 p.

A study of the content of industrial arts program in Great Bend, Kansas. Two plans for improvement are suggested: the general unit plan, and the general shop plan.

428. CAMPBELL, CHARLES A. (M.A.). *Industrial Arts in Rural Communities.* Ohio State University, 1934. 137 p.

A study of the needs of the junior and senior high schools of Belmont County, Ohio, as indicated by county industries, and a proposed program to fulfill those needs. The program is based on comprehensive general shop activities in mining, agriculture, automotives, general woodwork, and general metals industries.

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429. CAMPION, HOWARD ARTHUR (Ed.D.). *An Experimental Determination of Criteria for the Establishment of New Vocational Courses.* University of Southern California, 1941. 218 p.

A study to establish a set of items or criteria that might serve as a check on, or measure of, the advisability of adding an instructional program in a designated occupational field to the curriculum of a vocational school or a vocational department in a secondary school of the public school system.

430. CARLSON, V. SIDNEY (Masters). *A Study of the Vocational and Prevocational Offerings of the Morrocco High School with Recommendations for Enrichment.* Indiana State Teachers College, 1935.

431. CHENEY, CECIL W. *A Proposed Industrial Arts Program for Harry P. Harding High School of Charlotte, North Carolina.* M.S., 1950, University of Tennessee. 128 p. Library, University of Tennessee, Knoxville.

Purpose: To present an industrial arts program for a combination junior-senior high school with an enrollment of approximately 650 boys which can be used in its entirety or in part and to meet the needs of the pupils and the community.

Source of Data: Conferences were held with the administrators of the Harry P. Harding School including observations. Extensive research on occupational survey of the industries and business establishments of Charlotte.

Findings and Conclusions: The industrial arts program of Harding High School could be enlarged and thus render a valuable service to a greater number of the students. The number of skilled workers fell into 5 major classifications. Woodworking trades, automobile mechanics, machinists, other metal workers, and those in printing and allied fields. The largest single body of skilled workers were those following the woodworking trade, numbering 1,839; the second largest group was those employed as automotive mechanics, numbering 1,018; the machinists trade with 937 workers make up the third largest group. As a result of the survey, woodworking, automotive mechanics, machine shops, and metal working were chosen as a basis for the recommended industrial arts courses.

432. **CLAY, CASSIUS HARRY.** *An Industrial Arts Program for Iberville Parish.* M.S., 1954, Louisiana State University. 112 p. Library, Louisiana State University, Baton Rouge.

Purpose: To ascertain industrial background and the status of industrial arts in Iberville Parish, and to propose an industrial arts program to meet the needs of the parish.

Source of Data: Data were obtained from information forms sent to the principals of the four white secondary schools of Iberville Parish and to the graduates and dropouts of the four schools for the years, 1948–53.

Findings and Conclusions: Only one of the four schools had an industrial arts program. The principals were in favor of establishing industrial arts in their schools and were interested in assistance in planning the programs. Recommended programs for the four high schools are outlined.

433. **CROCKER, LAWRENCE D.** *A Suggested Program of Industrial Education in the Booker T. Washington High School, New Orleans, La.* M.A., 1950, University of Minnesota. 100 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop a comprehensive course outline to be used in the Booker T. Washington High School, New Orleans, Louisiana.

Source of Data: Data were obtained from a review of available literature.

Findings and Conclusions: A program of industrial education was developed to be used as a guide.

434. **DERRYBERRY, ROY FRANKLIN.** *The High School Vocational Program of Marshall County, Tennessee, in Rereefnce to Community Needs.* M.S., 1951, University of Tennessee. 98 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the high school vocational program of Marshall County, Tennessee, in reference to community needs.

Source of Data: Data were secured from business, industries, graduates of the high school, and present high school juniors and seniors.

Findings and Conclusions: Business and industrial personnel expressed a desire for more vocational courses and expressed a preference for graduates with industrial arts and commercial subjects. A majority of students expect to go to work immediately after graduation and desired more vocational training. It is recommended that the staff and offerings be enlarged, including the addition of programs of diversified occupations and vocational agriculture.

435. **DODGEN, HOWARD KEITH** (M.S.). *A Recommended Program in Industrial Arts for the Temple Public School System.* A & M College of Texas, 1938. 33 p.

A simple occupational survey of a small city with suggestions for an industrial education program for that city. It surveys the industries of Temple, Texas, 1930–1938, and outlines an industrial arts program for that community.

436. **DURHAM, JAMES H.** *A Proposed Industrial Arts Program for the Junior High Schools of Enid, Oklahoma.* M.S., 1951, Oklahoma Agricultural and Mechanical College. 77 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To recommend an industrial arts program that would enrich the present Enid High School curriculum and fit the needs of the community.

Source of Data: Data were obtained from books, magazines, newspaper articles and interviews with the Enid faculty.

Findings and Conclusions: Some of the deficiencies in the present program were revealed and a tentative program suggested.

437. **ECKERT, CLARENCE E.** *A Proposed Program of Industrial Arts for Euclid (Ohio) Schools.* M.A., 1948, Kent State University. 79 p. Li-

brary, Kent State University, Kent, Ohio.

Purpose: To lay the foundation for a more enriched industrial arts program for the Euclid City Schools, to show the need and to serve as a guide for the proposed program.

Source of data: A study of the present status of the industrial arts in the Euclid Schools in comparison with a newly proposed program by the author.

Findings and Conclusions: Industrial arts is recognized as an integral part of Euclid Schools. Some of the older courses were achieving the functions of the newly proposed program. Author advocates that a complete program of industrial arts should include all persons of all ages, in school and out, and cover all industrial subject matter areas. Industrial arts affects, directly, the avocational consumer, social and cultural functions.

438. **FAUGHT, ROSS C.** (Masters). *An Industrial Arts Program for Maple Heights High School.* Ohio State University, 1938.

439. **FLOM, EDROY C.** *The Present Plant Plan and Proposed Program for Industrial Arts In Benson High School.* M.A., 1954, University of Minnesota. 63 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To record the present plans and to assemble data for an enriched industrial arts program for future needs.

Source of Data: Data were obtained from existing plant facilities and plans in the local situation, and the proposed program was developed from recommendations of the Minnesota State Department and experienced men in the field.

Findings and Conclusions: A record of the present local situation was developed and a proposed program was outlined to serve as a guide in developing industrial arts at Benson High School.

440. **GARDNER, CHARLES HANES.** *A Printing Education Program for the High Schools of Lake County, Illinois.* M.S. in Ind. Ed., 1950, Kansas State Teachers College. 85 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To determine how best the printing education program could be advanced in the high schools of Lake County, Illinois, through curricular activities, equipment expansion, the guidance program, and good public relations.

Source of Data: Survey of the high schools and the printing industries in Lake County.

Findings and Conclusions: No close relationship exists between the school printing departments and the printing industries of Lake County. More equipment and space is needed for the program now in operation. There is need for printing courses for general education as well as for vocational purposes. There is a need for a more effective guidance and placement program. The community needs to be informed as to the nature and value of its school printing program.

441. **GARRISON, CHARLES GERALD.** *An Industrial Arts Program for the Junior High Schools of Bloomington, Illinois.* M.S., 1948, Illinois State Normal University. 85 p. Library, Illinois State Normal University, Normal.

Purpose: To outline an industrial arts program for the junior high schools of Bloomington, Illinois.

Source of Data: Data were secured through a study of the industrial arts program as it now functions in the junior and senior high schools of Bloomington.

Findings and Conclusions: Physical facilities, equipment, and course offerings in the present program are inadequate. A greater coordination between the industrial arts curriculum in the junior and senior high schools is necessary. The proposed program recommends an expansion of the general shop on the junior high school level to include woodworking, drawing, and metalwork in the seventh grade, and woodworking, drawing, and electricity in the eighth grade.

442. **GERBENS, HARRY BENJAMIN** (M.S.). *A Five Year Expansion Program for Industrial Arts in Port Arthur, Texas.* A & M College of Texas, 1931. 88 p.

A study of the status of and need for an improved program of industrial arts for Port Arthur. Recommendations in line with trends of the time are offered.

443. **GHRAMM, WILLIAM McKINLEY.** *A Plan for Reorganizing the General Shop of the Junior High School, Arkansas City, Kansas.* M.S. in Ind. Ed., Kansas State Teachers College, 1939. 53 p.

A plan for converting a unit shop into a general shop, including tool lists, record forms, and a bibliography.

444. **GONZALEZ, MARCELO (M.A.).** *A Proposed Type of Vocational School for Filipino Rural Education.* School of Education, University of Oregon, 1941. 129 p.

An analysis of the Philippine economic system and the school program in 1941. A school designed to meet the economic and educational needs of the people for further industrialization of the country is described.

445. **GREENFIELD, NEAL W.** *Related Arts in the Lower Grades—A Proposed Program for The Elementary Schools of Columbus, Ohio.* M.Ed., 1952, The Ohio State University. 59 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the status of related arts in the Columbus Schools, to present facts with respect to maturation of the individual and to coordinate the related arts experiences with a proposed unit of work.

Source of Data: None.

Findings and Conclusions: A unit of work dealing with air age education was developed. Teachers need assistance in coordinating these experiences and long range planning of related arts experiences is necessary.

446. **GROVE, GENE (M.S.).** *An Industrial Arts Program for the High Schools of Beaver County, Oklahoma.* Oklahoma A & M College, 1941.

A study of the need for an industrial arts program. A program designed to satisfy these needs is proposed.

447. **GRUNDSTED, ROBERT M.** *A Program of Industrial Arts For Robbinsdale Junior High School.* M.A., 1955, University of Minnesota. 87 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To organize a program of industrial arts for grades seven, eight, and nine.

Source of Data: Data were obtained from state curriculum bulletins, research papers, graduate and undergraduate course work, textbooks, workbooks, and teaching experiences.

Findings and Conclusions: A major intent at the Junior high level is the introduction of a wide variety of materials to each student and the opportunity to learn some of the basic processes involving the use of those materials. Industrial arts should not only provide information about tools and processes of industry, but also provide information about the human, social, and economic aspects of industry in this highly industrialized age.

448. **HAMILTON, JOHN V. (M.S.).** *Improving the Efficiency of the Trade School of Chanute, Kansas.* Colorado Agricultural & Mechanical College, 1939. 134 p.

A study of the adequacy and methodology of the training offered by the Trade School, Chanute, Kansas. The analysis was based on replies received from graduates of the School from 1931 to 1937. Recommendations for improvement are offered.

449. **HANSON, WESLEY.** *Developing an Industrial Arts Program for Castle Rock.* M.Ed., 1954, Central Washington College of Education. 39 p. Library, Central Washington College of Education, Ellensburg.

Purpose: To assist in the development of a more adequate industrial arts program in Castle Rock.

Source of Data: Data were secured from books, personal experiences, interviews, and the U. S. Department of Interior.

Findings and Conclusions: Schools that continue the unit type of shop, where only one shop is available, are partly responsible for the lack of prestige of industrial arts in the small schools. This program with its limited content simply cannot be justified in the light of general education.

450. **HARDY, JOHN G.** *A Program of Public Vocational Education for Palm Beach County, Florida.* M.S., 1949, The University of Tennessee. 200 p. Library, University of Tennessee, Knoxville.

Purpose: To make a study of the vocational education program as operated in Palm Beach County, Florida; to evaluate the present services being rendered; also to consider the possible expansion of services to meet total needs; and to provide the opportunities for training in the maximum degree possible in the community.

Source of Data: A comprehensive questionnaire was prepared and by means of a survey committee data were secured from a total of 219 employers and involving more than 2,300 workers. The legislation (local, State and Federal) which made possible vocational education was studied. A complete list of manufacturers and employers within the county was secured.

Findings and Conclusions: The present vocational school program has been functioning successfully in that a number of former students have been employed locally and the majority of local employers state a preference for vocational school trainees. Eighty-four apprentices were employed locally who received preliminary training at the vocational school. One hundred and seventy employers expressed need for help from the vocational school. One hundred and fifty-four establishments in 18 different occupations indicated need for new workers in ensuing year. Of these all but 8 could receive some training at the school in the present program. Conferences are recommended for certain employer groups for whom no training is available at present but who might be served either through preemployment trade preparatory classes or by part-time and evening trade extension classes. The appendix includes some interesting views of trade preparatory classes now in operation.

451. **HENDRIXSON, VERNE L.** *Reorganization of the Industrial Arts Program for Burrton High School, Burrton, Kansas.* M.S., 1951, Kansas State Teachers College. 80 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To set up a plan for changing the unit shop that now exists to a general shop with areas that will best fulfill the objectives of general education.

Source of Data: Data were gathered from male graduates of the classes of 1944 to 1950 inclusive and from printed materials.

Findings and Conclusions: A course of study was developed to include five areas: drawing, woodwork, electricity, welding, and automobile mechanics. The automobile mechanics phase is to be restricted largely to consumer information.

452. **HOSSMAN, ARTHUR WILLIAM.** *A Reorganized Industrial Arts Program for Minford High School.* M.Ed., 1952, The Ohio State University. 54 p. Library, The Ohio State University, Columbus.

Purpose: To reorganize the industrial arts program at Minford High School.

Source of Data: Data were obtained from a study of the occupations of the fathers, the work in which recent graduates are employed, and the type of employment industrial arts students prefer to do after leaving school.

Findings and Conclusions: A program was developed to meet the needs of students and a laboratory was planned in which to offer the work.

453. **HUGHES, ARLIE P. (M.A.).** *To Construct an Industrial Arts Program To Conform With the New State Tentative Course of Study for a School Employing Seven Teachers.* Southwest Texas State Teachers College. 1939. 84 p.

A course of study for seventh grade laboratory of industries, and for woodwork for eighth and ninth grades in the small high school.

454. **JAMISON, LLOYD (M.S.).** *An Industrial Arts Program for the Arnold (Kansas) High School.* Colorado Agricultural & Mechanical College, 1941. 81 p.

A suggested course of study and the equipment needed for an industrial arts program. The extent to which the current program meets the needs of the community is discussed and changes are recommended.

455. **JORDAN, GLENN C. (M.A.).** *Program for Industrial Arts for Hawken School.* Ohio State University, 1946. 72 p.

A study of the introduction of an industrial arts program in an academic curriculum for the purpose of developing a broader program for the elementary and junior high school levels to meet the needs of the students.

456. **KALLINA, HENRY E. (M.S.).** *A Proposed Vocational Education Program for the City of Victoria, Texas.* A & M College of Texas, 1939. 30 p.

A proposed program of vocational education for Victoria, Texas based on an occupational survey of that city.

457. **KEENE, A. R. (M.S.).** *A Survey of the Industries of Sherman To Determine a Vocational Program for Adults and a More Functional Program for the Senior High School.* North Texas State College, 1948. 80 p.

A survey of the major industries of Sherman, Texas, in 1948, to ascertain employment opportunities and requirements. The vocational needs of adults in Sherman, Texas, are described and a specific program for high school youth of that city is recommended.

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458. KINI, KULAI HARAYANA (Doctors). ***Proposals for a Program of Vocational Education for Mysore, India, Based upon Experiences in Mysore and the United States of America.*** **Columbia University, 1933.**

459. KNIGHT, CONRAD WALLACE. ***A Suggested Development of a One-Teacher Industrial Arts Program—With Particular Reference to the P. K. Yonge Laboratory School.*** **M. Ed., 1953, University of Florida. 265 p. Library, University of Florida, Gainesville.**

Purpose: **To outline and develop a one teacher industrial arts program for the P. K. Yonge Laboratory School.**

Source of Data: **Data were secured from books, periodicals and theses.**

Findings and Conclusions: **Through the use of a wide assortment of instruction units, personnel system, and visual aids, a general shop program is possible and advisable in the small school.**

460. KOKESCH, WALTER ALFRED. ***A Plan of Reorganization of the Industrial Arts Plant and Program for Willmar High School.*** **M.A., 1952, University of Minnesota. 69 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: **To ascertain the need for industrial arts in the Willmar Schools.**

Source of Data: **Data were obtained from census figures and enrollment figures.**

Findings and Conclusions: **Present plant, curriculum offerings, and instructional staff are inadequate. Suggestions are offered for expansion to meet the larger enrollments and also to provide an enriched program of industrial arts.**

461. LANDIS, ROBERT C. (Masters). ***A Study to Determine the Factors Which Should be Considered in Planning Vocational Industrial Courses in a Community of 12,000 Population.*** **University of Pennsylvania, c. 1935-47.**

462. LOVING, PHILLIP L. ***A Proposed Junior High School Industrial Arts Program for Temple, Texas.*** **M.S., 1950, Oklahoma Agricultural and Mechanical College. 57 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: **To recommend to the school board of Temple, Texas, a program of general shop for junior high school.**

Source of Data: **Library research, personal interview and general observation.**

Findings and Conclusions: **There was much evidence among educators and patrons of the school that some "doing" activity is essential in the school program to stimulate pupils in continuing their education, to offer knowledge useful in an industrialized society.**

463. LOWE, JAMES RAY (M.S.). ***Needed Changes in the Industrial Arts Program of Greenville Junior and Senior High Schools.*** **East Texas State Teachers College, 1941. 92 p.**

An investigation of the needs for industrial arts in the junior and senior high schools of Greenville, Texas, and the extent to which these needs are being met. Suggestions for an improved program are offered.

464. LOWE, WAYNE L. (Masters). ***A Study to Determine the Need for and the Possibilities of Offering Industrial Education in Terre Haute, Indiana.*** **Indiana State Teachers College, 1933.**

465. MADDOX, JOE LEWIS. ***A Curriculum of Industrial Arts for Hamilton County, Tennessee.*** **M.S., 1954, University of Tennessee. 95 p. Library, University of Tennessee, Knoxville.**

Purpose: **To formulate an improved industrial arts program for Hamilton County, Tennessee.**

Source of Data: **Data were secured through questionnaires sent to industrial arts teachers, interviews, and records of the Chattanooga Chamber of Commerce and from records of the superintendent of the Hamilton County public schools.**

Findings and Conclusions: **No industrial arts classes were offered at the Birchwood, Hixon, Ooltewah, and Sale Creek high schools. Hamilton County as a whole does not offer a sufficient variety of industrial arts experiences. It is recommended that a general shop course made up of six areas be offered as a beginning course in all senior high schools.**

466. MAMULU, MOSES MAMMADI. *A Revised Program of Vocational Education For Booker T. Washington Agricultural and Industrial Institute With Implications For Liberia.* M.A., 1953, The Ohio State University. 111 p. Library, The Ohio State University, Columbus.

Purpose: To examine the need for technically trained personnel to develop the natural resources of Liberia and to develop a program of training at the Booker T. Washington Agricultural and Industrial Institute to meet the need.

Source of Data: Data were obtained from a questionnaire sent to the educational leaders in Liberia and a critical examination of the curriculum of the Booker T. Washington Institute.

Findings and Conclusions: A program was proposed for the following major areas: industrial arts for the vocational-industrial education; home economics; business and distributive education; academic education.

467. McGLASHAN, MARY D. (M.A.). *Vocational Education: Proposals for a Vocational School to Train Cooks for Restaurants, and Other Less Specialized Positions in Food Preparation.* Teacher's College, Columbia University, 1936. 21 p.

Describes the need for a vocational school offering training in less specialized positions. It suggests a program covering the scope and character of the school and the types of positions for which the school will train.

468. McLELLAN, WARREN ERNEST. *Proposed Areas of Industrial Education for the Community College of Fort Smith, Arkansas.* M.S., 1951, Kansas State Teachers College. 156 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the areas in industrial education that would adequately serve the community college in the Fort Smith area.

Source of Data: Data were obtained from questionnaires submitted to boys of Ft. Smith High School and to the freshman and sophomore boys of the Ft. Smith Junior College. A follow-up study was made of two hundred and eight male graduates from Ft. Smith Senior High School and fifty-eight male graduates of Ft. Smith Junior College. Additional information was gleaned from Junior College bulletins of thirty-seven institutions located in Arkansas, Kansas, Oklahoma, and Missouri.

Findings and Conclusions: The industrial education proposals include the following areas: electricity, drafting, woodwork, art, crafts and design, auto mechanics, metalwork, and printing with aeronautical and agricultural courses integrated into these seven areas. The proposed areas are planned in a convenient and economical arrangement which can be easily managed by two or three instructors.

469. MEAIRS, F. L. CLAYTON. *Suggested Program Reorganization of a Unit Woodwork Shop to a General Shop.* M.S. in Ind. Ed., Kansas State Teachers College, 1938. 126 p.

A proposal, including content, for reorganizing a unit shop into a general shop.

470. MINICH, CARL E. (Masters). *The Reconstruction of Industrial Arts in a Central High School.* University of Buffalo, 1942.

471. MOORE, PAUL HARRIS (M.S.). *A Plan for Integrating a "General Shop" Program.* Oregon State College, 1937. 132 p.

A study of the success of the general shop with an integrated program and the place of the unit type shop in the industrial arts program.

472. MORGAN, JACK W. *Industrial Arts in Pittsburg Senior High School.* M.S. in Ind. Ed., 1949, Kansas State Teachers College. 60 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To study the present industrial arts program at Pittsburg Senior High School with a view to improving the program to better fit the needs of the male students.

Source of Data: Occupational data were obtained from Kansas State Employment Service on the City of Pittsburg and the State of Kansas. Data on the United States were obtained from compilations prepared by the U. S. Department of Commerce. Interviewed the male personnel of the years 1937, 1946, 1947, and 1948 either directly or through relatives.

Findings and Conclusions: The majority of the students of the classes surveyed do not live in Pittsburg any more. Those entering professions, percentage-wise are about 3 times national, State, and city averages and are paralleled by the number receiving college degrees. Since a large percentage of the students surveyed go into skilled, semi-skilled, and unskilled pursuits, and since interest in industrial arts was high it was concluded that all students at Pittsburg Senior High School should be fully informed as to their probable future occupational status in order that they may pursue a more practical curriculum.

473. MOTON, LEON A. *A Projected Program of Industrial Arts with Special Emphasis on the Secondary Program for the Public Schools of Virginia.* **M.A., 1950, Ohio State University. 123 p. Education Library, Ohio State University, Columbus.**

Purpose: To examine the present offerings of the industrial arts curricula; to set up some criteria for a good program; to determine bases for a suitable program for Virginia schools; to project a program to meet the deficiencies in the present program and to make recommendations to the State Board of Education for a better program.

Source of Data: A selected list of schools was compiled whose enrollments were 600 or more. Letters and questionnaires were addressed to 130 schools or superintendents.

Findings and Conclusions: Industrial arts in Virginia does not offer experience for more than one-third of the students in the schools examined. Virginia is far behind most of the States in their industrial arts program. Virginia should establish a school for training industrial arts teachers.

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474. NEALIS, MICHAEL FRANCIS. *The Development of a Tentative Vocational Education Training Program for the Mount Vernon (N.Y.) Public Schools Based Upon a Survey of the Occupational Distribution of Residents of that Community.* **Ed. D., 1951, New York University. 148 p. Library, New York University, New York.***

Purpose: To examine the current program of vocational education in the city of Mount Vernon, to ascertain whether it was meeting accepted trades standards, if there were occupational opportunities for students in the program, and to make recommendations for improvement based on findings.

Source of Data: Data were secured from U. S. Census Reports, Reports of N. Y. State Agencies, Local Chamber of Commerce and Board of Trade, Reports and Conferences with Trades Commissions, Labor Market Studies, Investigation and Report, Critical Evaluation of present program, questionnaire, statistical analysis and job and course of study analysis.

Findings and Conclusions: This study presents definite numerical and job classifications, a description of employment distribution, an estimated annual worker replacement schedule and a description of occupations occurring in the labor market area. It further indicates the manner in which the present training program is correlated with job opportunities and occupational requirements, presents recommendations for course modifications, and emphasizes by-products pertinent to cultural and citizenship education which are concomitant to a program of training in skills.

475. NEDOM, LEROY EDWARD. *An Integrated Industrial-Arts Program For The Grant Union District Secondary Schools of Sacramento County, California.* **M.S., 1954, Oregon State College. 79 p. Library, Oregon State College, Corvallis.**

Purpose: To establish an industrial-arts program for the junior and senior high schools of the Grant District.

Source of Data: Data were obtained from books, bulletins, magazine articles and research reports.

Findings and Conclusions: There is a need for increasing the number of areas offered at all levels, and for the revision and expansion of the industrial arts program in grades 7 through 12. The program should include boys and girls. A qualified industrial arts instructor should be employed to supervise the program.

476. NICHOLS, AMBROSE REUBEN (M.A.). *The Development of a Vocational Program in a City of Sixty Thousand.* **Stanford University, 1935. 126 p.**

A critical analysis of the vocational program in San Jose, California, with the intent to develop fundamental principles of operation.

477. PARKS, W. J. (Masters). *What Types of Occupational Training Should Be Offered for Boys in the Cleveland Junior-Senior High School, Cleveland, Mississipi.* **University of Alabama, 1939.**

478. PARSONS, LACEL W. *A Study for the Development of a General Industrial Training Program in the Small Oil Field Community.* **M.S., Okla-**

homa Agricultural and Mechanical College, 1945. 91 p.

A description and general outline of an industrial training program for the small oilfield community based on local employment surveys and interviews with representatives of industry.

479. PAUL, CARL E. (Masters). *Adapting the General Industrial Program to a Comprehensive High School.* Oklahoma A & M College, 1936.

480. PECK, GARVIN A. *The Community Shop in the Small High School.* M.S., 1949, Oklahoma Agricultural and Mechanical College. 65 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

***Purpose:* To plan a community shop for the Okemah Public Schools, in the belief that the small high school must change from conventional woodworking and drawing to a more diversified industrial arts program.**

***Source of Data:* A questionnaire was completed by the students of the junior and senior high school to ascertain the subjects that were of most interest to them.**

***Findings and Conclusions:* Seven subjects, automobile mechanics, electrical work, leather work, plastic, photography, welding and woodworking received 73 percent of all votes cast. These subjects were recommended for students beginning with the eighth grade where it would be required on a rotation basis. The facilities of the shop should be made available to the adults of the community.**

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481. PERDUE, SAUL MARTIN. *Proposed Program and Organization for Baltimore's Carver Vocational-Technical High School.* Ed.D., 1954, Columbia University. 205 p. Teachers College Library, Columbia University, New York.

***Purpose:* To formulate a program and organization for the Carver Vocational-Technical High School of Baltimore, Maryland.**

***Source of Data:* Data were secured through an analysis of the present program and organization, community needs, actual experiences in the present school, educational practices in literature, and practices observed in thirty schools visited.**

***Findings and Conclusions:* The major conclusions were to initiate a diversified occupations form of training for trades of low enrollments, initiate a technical curriculum that is geared to college preparatory requirements, offer a tenth grade program in general education, increase the number of trade offerings by ten, and to eliminate the two year vocational curriculum.**

482. PIPPIN, CARROLL BRYANT. *A Survey to Determine if the Vocational Education and Industrial Arts Program of the Orange Public Schools is Meeting the Needs of the Community.* M. S., 1949, North Texas State College. 113 p. Library, North Texas State College, Denton.

***Purpose:* To study and evaluate the industrial arts and vocational education programs of the Orange, Texas, Public Schools in terms of the needs of pupils, parents, and industries of the community.**

***Source of Data:* Personal interviews were held with community employers, and questionnaires were sent to employers, present and former students, and parents to determine what a sound program would ordinarily include.**

***Findings and Conclusions:* Machinery and materials were inadequate, classes were too crowded, and too much class time was spent on lecturing and not enough time allowed for audio-visual aids and laboratory work. It was suggested that courses including electrical work, auto mechanics, and blueprint reading be added to the curriculum, that class periods be lengthened, that more audio-visual aids be used, and that periodical surveys be made of community interests and needs for determining future curriculum changes.**

483. PRICKETT, CHESTER EUGENE. *A Program of Vocational Education for Floyd County, Georgia.* M. S., 1951, University of Tennessee. 112 p. Library, University of Tennessee, Knoxville.

***Purpose:* To develop a proposed program of vocational education for Floyd County, Georgia.**

***Source of Data:* Data were obtained from interviews and school records.**

***Findings and Conclusions:* For the great majority of students in the high schools in the county, there was very little opportunity to prepare for a trade. The high schools were predominately college preparatory in nature, while only 5 percent of county's working force were in professions. The analysis of the employment situation indicated that high school courses in auto mechanics, general repair, machine shop, plumbing, woodworking, carpentry, and commercial subjects could be justified.**

484. REITZEL, WARREN C. *The Problem of Developing Industrial Arts in the Leyden Community High School at Franklin Park, Illinois.* **M. A., 1953, The Ohio State University. 83 p. Library, The Ohio State University, Columbus.**

Purpose: To develop plans for the expansion of the industrial arts facilities at Leyden Community High School, Franklin Park, Ill.

Source of Data: Data were obtained from readings, consultation with leaders in the field. and an evaluation of the local situation.

Findings and Conclusions: Full development and resulting benefits of industrial arts are not being realized at Leyden. Specialisation in vocational training has overshadowed the general education role of industrial arts.

485. RHEEL DELBERT C. *A Proposed Industrial Arts Curriculum for the Secondary School of Fort Meyers, Florida.* **M. Ed., 1952, University of Florida. 94 p. Library, University of Florida, Gainesville.**

Purpose: To plan an industrial arts program which will aid in satisfying the needs of the students in the secondary schools of Fort Meyers, Florida.

Source of Data: Data were secured from study of other programs, visitations, and curricula investigations.

Findings and Conclusions: The concept of industrial arts must change constantly under the impact of technological advances.

486. RICE, HERBERT R. *A Program Of Industrial Arts For St. James High School, St. James, Missouri.* **M. S., 1953, Kansas State Teachers College. 38 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To set up a proposed program of industrial arts for the St. James, Missouri, High School.

Source of Data: Data were obtained from a survey, school policies, state regulations and literature.

Findings and Conclusions: A separate building for the department was recommended. A floor plan and shop layout were developed. The initial shop for ninth grade was recommended to be composite general shop, followed by unit shops in drawing, woodwork, and metalwork areas.

487. RITTER, MORTIMER C. (Masters). *The Development of a Central Trade School to Meet the Needs of a Specific Industry.* **Teachers College, Columbus University, 1934.**

488. RUSH, ENNIS HURSHAL (M. S.). *A Development Program of Industrial Arts For New Orleans Public Schools For the Next Five Years.* **Louisiana State University and A & M College, 1948. 133 p.**

A comparative study of the industrial arts program of the Orleans Parish schools and twenty-five cities, with recommendations for a five-year improvement program in the city of New Orleans.

489. RYAN, CECIL McARTHUR. *The Air-Age Education Program at Tennessee Agricultural and Industrial State College.* **M. S., 1949, Tennessee Agricultural and Industrial State College. 64 p. Library, Tennessee Agricultural and Industrial State College, Nashville.**

Purpose: To ascertain the need for an aviation education program, to evaluate the present program, and to offer suggestions for improving same.

Source of Data: Data were obtained from records, and by questionnaires and letters sent to 32 colleges and universities.

Findings and Conclusions: Deficiencies exist in trade offerings, laboratory space, and equipment. Educational background and experience of personnel and instructional procedures are satisfactory.

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490. SHANTHAMALLAPPA, B. L. *A Plan for the Development of Vocational Education in the State of Mysore, India.* **Ph. D., 1950, University of Michigan. 215 p. General Library, University of Michigan, Ann Arbor.**

Purpose: To present a plan for the development of vocational educational in the State of Mysore, India, primarily at the secondary level.

Source of Data: The social and economic conditions in Mysore were analyzed for their implications for desirable and essential education for workers in the State. The aims and objectives of education in the U. S. were used as reference-guides for evolving the plan.

Findings and Conclusions: A plan is presented which incorporates the following salient features: A permanent agency should be established in the State Department of Industries and Commerce to conduct an occupational survey, to analyze and classify occupations, to furnish information concerning the occupational demands and trends of the State. A comprehensive program of vocational guidance should be set up in the secondary schools to help young people to choose an occupation, prepare for it, enter and progress in it. Practical instruction in junior high school should provide general education to pupils as well as an opportunity to explore the possible occupational avenues. The industrial, agricultural and commercial schools should be reorganized and expanded to meet some of the occupational needs of society. The responsibility for training women as homemakers should be transferred from the home to the school. All phases of vocational education should be placed under the conrtol of the Department of Public Instruction to secure the proper coordination and unity in the total educative process.

491. SMITH, CLAYTON S. ***Developing A Program of General Metalwork With Specific Reference to the Silvercreek Township High School, Jamestown, Ohio.*** **M. A., 1953, The Ohio State University. 59 p. Library, The Ohio State University, Columbus.**

Purpose: To develop general metalwork programs in the schools in Greene County.

Source of Data: Data were obtained from a pilot study of the program at Silvercreek High School.

Findings and Conclusions: A course of study including art metalwork, bench metalwork, foundry, welding, and machine shop was developed for use on a country-wide basis.

492. SPEIER, BERTHOLD A. (M. S. in Ed.). ***A Plan for the Organization and Operation of a Department of Industrial Processes in a Technical High School.*** **Cornell University, 1937.**

493. SWENDER, CLYDE E. (M. S.). ***Building a Vocational Program for the Argentine High School.*** **Kansas State Teachers College, Emporia, 1936. 98 p.**

A study of 427 boys who were enrolled in the Argentine High School during the years 1932–1936 in respect to their courses of study and their occupations after graduation. The study also includes a survey of the boys who dropped from school during this period. Benefits and deficiencies noted in the curriculum of the Argentine High School as seen by the author, the students, and the staff members, are discussed.

494. THOMAN, W. F. (M. S.). ***The Diversification of Industrial Arts Offerings in Small High Schools of Kansas.*** **Colorado Agricultural & Mechanical College, 1941. 89 p.**

A study of whether the industrial arts program in small Kansas schools should be general or agricultural in objective. An appendix lists tools and equipment recommended for six units in industrial arts.

495. TURNER, C. E. (M. S.). ***Needs for Day Trade Training in Certain Trades in Phoenix, Arizona.*** **Colorado Agricultural & Mechanical College, 1932. 71 p.**

A study of the needs for day trade training in sheetmetal, barber, and cosmetology trades in Phoenix, Arizona. Day trade training and industrial arts are compared, and recommendations for furthering the program are suggested.

496. VOORHIES, EDWIN S. ***Janitorial Services at Middle Tennessee State College.*** **M. A., 1953, Middle Tennessee State College. 238 p. Graduate Division, Middle Tennessee State College, Murfreesboro.**

Purpose: To consider the problem of janitorial services which pertained to the buildings on the campus of Middle Tennessee State College, Murfreesboro, Tennessee.

Source of Data: Data were secured from a detailed survey of all janitorial services at Middle Tennessee State College from March 1951 to June 1953. Some experimental work was carried out in the area of maintenance. Requisitions, invoices, specifications, and purchase orders were reviewed. Efficiency charts on janitors were made and used.

Findings and Conclusions: The findings and conclusions were arranged in such a manner as to represent a pattern of operation for janitorial services on the campus. The janitors were given an index of efficiency. All products used on the campus for maintenance purposes were rated with an index of efficiency.

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497. WARDWELL, WAYNE D. *An Educational Program for Technical High Schools in India.* **Ph. D., 1950, Ohio State University. 358 p. Education Library, Ohio State University, Columbus.**

Purpose: To plan a program of education which is possible of execution and which will help individuals to be ready for the changes that must come about as India becomes an industrial nation.

Source of Data: A study of education as it has been carried on in the past and is being done at the present. The needs, interests and desires of individuals, the needs and problems of the country, the trends of the times and the resources of the country were studied. On the basis of the needs of the students and people and the means available, a plan of technical education is presented.

Findings and Conclusions: To implement the program which has been proposed the following recommendations were offered: central and provincial boards of education should provide leadership; private enterprise should assist financially; variations in programs should be encouraged; model schools established; fees and grants-in-aid should support schools until tax support is practical; competent teachers should be employed, assisted by apprentice teachers; in-service teacher education services developed; facilities carefully selected; total program to include technical and academic opportunities; modern teaching aids employed; guidance services established; adult education provided; literacy teams organized; information concerning population control included in physiology and hygiene classes in the adult program.

498. WHAM, R. I. (Masters). *Suggestions for the Organization of a County Trade School for Seminole County, Oklahoma.* **Oklahoma A & M College, 1940.**

499. WHEELER, PAUL S. (M. S.). *A Plan for the Industrial Arts Department in Bartlesville, Oklahoma, Junior College.* **Colorado Agricultural & Mechanical College, 1940. 57 p.**

A review of the objectives of junior colleges and high schools. These objectives are compared in the light of functional knowledge desired. The content for a curriculum is outlined.

500. WYNN, PHAIL. *A Survey of the Industrial Arts Programs in the Separate Schools in Oklahoma and a Proposed Program for These Schools.* **M. S., 1950, Oklahoma Agricultural and Mechanical College, 76 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To formulate an industrial arts program for the separate schools in Oklahoma which includes: Course of study for 5 shop subjects, a plan for a suitable shop building, and suggested list of equipment necessary for carrying on the program.

Source of Data: There are 4 methods used: Questionnaire, library material, textbooks in shopwork, personal interview.

Findings and Conclusions: The industrial arts shops show a wide range of variation which is accounted for in some cases by the enrollment. Shops with large enrollments are better equipped than those with a smaller enrollment. Other conclusions based on the survey returns are: Woodwork in some forms is taught in every shop, the greatest number of students are enrolled in woodwork, most shops make projects, equipment varies with size of shop and enrollment, quality of project and test are most generally used as measures of achievement, number of schools offering industrial arts is 50.

501. YOUNGBLOOD, ERWIN A. *Proposed Program of Industrial Education for Waco Public Schools.* **M. Ed., 1951, Agricultural and Mechanical College of Texas. 36 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.**

Purpose: To present the "ideal" industrial education program for a city with the resources, industries, and population of Waco, to show the characteristics of the present industrial education program in the Waco Public Schools, and to adjust the ideal program to fit the facilities offered by the Waco system.

Source of Data: Data were secured from books, periodicals, publications of learned organizations, and encyclopedias.

Findings and Conclusions: The high school woodworking classes are crowded and the metal working classes are small. The plan submitted would provide junior high school boys with a diversified industrial arts training program. This should help alleviate the lop-sided program in the high school.

Public Relations

502. BALLARD, JOHN ROGER. *Publicity Program for Industrial Arts Based Upon Industrial Public Relations Practice.* M. A., 1951, Southwest Texas State Teachers College. 189 p. Library, Southwest Texas State Teachers College, San Marcus.

Purpose: To furnish a plan and materials for interpreting industrial arts to the general public, and to show that a broader knowledge and a deeper appreciation of industry can be taught through industrial arts courses.

Source of Data: Data were secured from literature, interviews, and letters.

Findings and Conclusions: Good public relations programs are the result of planning. Most media and techniques utilized successfully by industry can be used by the industrial arts teacher. Student-teacher planning in public relations activities is desirable for general education and industrial arts purposes.

503. BENDIX, JOHN. *Public Relations for Industrial Arts.* M. A., 1951, University of Minnesota. 81 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To aid or guide in the development of public relations programs for industrial arts in our public schools.

Source of Data: Data were obtained from periodicals, bulletins, and books.

Findings and Conclusions: Written material on public relations in education was lacking and no books were found that dealt with publicizing industrial arts. More writing material is urgently needed to assist in improving our public relations.

405. CHAMNESS, P. W. (M. S.). *A Plan of Publicity for the Adult Education Program in Topeka, Kansas.* Colorado Agricultural & Mechanical College, 1940. 61 p.

Ten principles to be considered when attempting a publicity program. A program is planned for Topeka.

505. DIXON, R. J. *Public Relations Through the Newspapers for the Public Schools of the State of Minnesota.* M. S., The Stout Institute, 1941. 108 p.

A study to determine the most effective use of newspapers in developing a public relations program for the public schools.

506. DUNLAP, CLAVIN GRINDLAY. *Publicizing Industrial Arts in Louisiana.* M. S., 1949, Louisiana State University. 118 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine the most effective means of publicizing industrial arts and to provide industrial arts instructors with information necessary to establish their own publicity programs in the various public secondary schools and communities throughout the State of Louisiana.

Source of Data: Instructors supplied the information by questionnaire relative to: Their efforts in publicizing industrial arts; the understanding their schools and communities had toward the program; and the success various publicity practices attain in reaching administrators, teachers, students, parents, and the public.

Findings and Conclusions: Although instructors agreed that industrial arts needed more publicity, few actually practiced advertising. Only a few of the many publicity practices were in use. For example, articles in school publications, project displays during school "open house," project displays in show windows of schools and business establishments, written or oral personal contacts. Many schools and communities held misconceptions of industrial arts. Parents are easiest to reach through publicity; students rank second; teachers, third; public, fourth; with school administrators ranking most difficult.

507. HULTNER, RAYMOND CHARLES. *Public Relations for Wisconsin Vocational and Adult Schools.* M. A., 1952, University of Minnesota. 72 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To discuss the characteristics and importance of an efficient public relations program for the Wisconsin Vocational and Adult Schools, and desirable ways and means of conducting such a program.

Source of Data: Data were obtained from an opinion poll conducted with a group of 23 directors of the Wisconsin Vocational and Adult Schools.

Findings and Conclusions: Partially uniform ideas and opinions about public relations programs were obtained during the survey. In some cases there were evidences of good, well-planned public relations programs, and yet others exhibited an unawareness of the true nature of public relations.

508. **KILBY, WILLIAM D.** *Bulletin of Industrial Division New York State Agricultural and Technical Institute, Morrisville, New York.* M. S. in Ed., 1948, Cornell University. 106 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To give prospective students information concerning the Industrial Division of the Institute.

Source of Data: Bulletins from other institutions were reviewed.

Findings and Conclusions: A bulletin for the Industrial Division of the New York State Agricultural and Technical Institute covering the calendar, general information, and the seven departments.

509. **POLLARD, EUGENE C.** *Present and Proposed Public Relations for Industrial Education In The Orange Independent School District.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 47 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To discover methods of obtaining increased public support for the industrial educational program.

Source of Data: Data were secured from books, bulletins, and journals.

Findings and conclusions: For schools to survive, there must be complete and honest interpretation of their programs, and they must show cause for, and be worthy of, continuous support of the people.

510. **SALE, LEONARD CHARLES.** *Recruitment Media Used by State Junior Colleges, Municipal Colleges, and Four-Year State Colleges.* M. S., 1952, Kansas State Teachers College. 43 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To compare recruitment practices in Northern Oklahoma Junior College with those in other junior colleges and the small four-year colleges.

Source of Data: Data were obtained from catalogs and administrative records of junior and small four-year colleges, literature on recruitment, and questionnaires.

Findings and Conclusions: In the final analysis the best recruitment media are the students themselves. They are the disciples of the institution who will form the future alumni organization.

511 **SHOGREN, MELKER J.** *Evening School Publicity.* M. S., 1948, The Stout Institute. 64 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To determine the adequacy of the publicity program of the evening school program at the School of Vocational and Adult Education in West Allis, Wisconsin.

Source of Data: A study was made of the local situation, available literature, and of the areas covered by 16 other vocational schools in the State. The measure of adequacy of this program was based primarily on the programs as carried on in the other school studies. The methods used included a combined questionnaire and check list on a review of the literature.

Findings and Conclusions: A publicity program is essential in a school, and, although such a program is comparatively new in the vocational program, this school had an adequate program. The study resulted in a listing of pertinent facts about publicity with the following recommendations: Publicity materials should be part of all school curriculums; the suggested bibliography should be used as a basis for setting up such a program with a view toward adding new materials when they become available; a careful record should be kept of all phases of publicity in the school; courses dealing with the techniques of modern publicity should be taken by the personnel of the school and such work should be given credit on the salary schedule; and a study should be made of modern techniques of educational publicity which may have a practical application to the program.

512. **SMITH, ROBERT E. (Masters).** *Publicity for Industrial Arts.* Ohio State University, 1932.

513. **TAYLOR, HAROLD.** *How the Industrial Arts Teacher Can Improve His Program Through Public Relations.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 10 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To assemble information which may be of value in developing an understanding of the importance of an industrial arts program to a community.

Source of Data: Data were obtained from books.

Findings and Conclusions: An active industrial arts teacher, wisely presenting his views, can do much in a community toward promoting an industrial arts program. Since each community is different, the teacher will need to analyze his community to determine the appropriate promotional approach to use.

514. **ZABCIK, CALVIN L.** *Public Relations in Industrial Arts.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 27 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To analyze the need for a public relations program in high school industrial arts departments and to assemble ideas, which have proven successful, for the purpose.

Source of Data: Data were obtained from books, magazine articles, bulletins, similar problems, and from workshop sessions.

Findings and Conclusions: Industrial arts teachers are definitely lax with respect to public relations. It is important that the community be thoroughly informed as to why, how, and what industrial arts is trying to accomplish. Public relations is an individual process, and the media used must be suited to a particular situation.

Shop Organization and Planning

515. **AHLF, ARVIN A.** *Student Personnel Organization.* M. A., 1952, University of Minnesota. 103 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To plan a sound, efficient pupil personnel organization that will help attain the general objectives of industrial arts.

Source of Data: Data were obtained through literature dealing with pupil personnel plans, a review of books, periodicals, bulletins, unpublished material, and courses of study.

Findings and Conclusions: Pupil personnel organizations can eliminate routine instructor duties, develop student initiative and responsibility, and help prevent accidents. The foreman is the key man in any such organization. There is no one specific type of organization that is better than all others.

516. **AMES, LEON WASHBURN (M. S.).** *Personnel Organization in Industrial Arts Classes.* Oklahoma A & M College, 1941. 112 p.

A study of personnel organization in industrial arts classes, with a recommended plan to meet the demands and requirements of industrial arts classes and industry.

517. **ANDERSON, HERBERT ADOLPH.** *Industrial Arts Student Personnel Organization.* M. A., University of Minnesota, 1947. 67 p.

A survey and documentary study of industrial arts student personnel organization to determine basic principles, common practices, and procedures. An organization of both the line and staff and the functional type is suggested. Each organization with assigned duties peculiar to its own needs is described.

518. **BAKER, CLIFFORD R.** *Student Directed Management for Shops and Laboratories.* M. Ed., 1949, Wayne University. 41 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To develop a plan for student directed management of industrial education shops and home economics laboratories.

Source of Data: Data were obtained from the findings of the Student Management Committee of the Detroit Public Schools.

Findings and Conclusions: General principles of student management are fairly well established. Definite contributions to the education of the child are made in such programs.

519. **BAMBERGER, DONALD E.** *A Device for Identifying Behavior Problems in Junior High School Industrial Arts.* M. Ed., 1953, Wayne University. 29 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To construct a device for identifying behavior problems in the junior high school shop.

Source of Data: Data were obtained from books and magazines in the field of industrial arts.

Findings and Conclusions: Recommendations are made for the construction and use of the device in the individual teaching situations.

520. BARNHART, E. L. (M. S.). *The General Shop in New Jersey, 1940—A Study of the Factors Affecting the Use of Pupil Foreman Personnel Organization in the Comprehensive General Shop in Towns to 30,000 Population.* The Stout Institute, 1940. 58 p.

A survey including sixty-nine per cent of the industrial arts general shop teachers in New Jersey to determine the amount of work being done in general shop pupil-personnel programs.

521. BARTHOLOMEW, ROY ARTHUR (M. A.). *The Development and Application of Check Lists and Other Procedures in Secondary Shop Planning.* State University of Iowa, 1938. 141 p.

A study of shop arrangement and equipment in fifteen high schools ranging in size from those of Pittsburgh, Pennsylvania, down to that of Kalona, Iowa, with recommendations for improvement in the provisions in shop plans.

522. BASICH, PETER PAUL. *Functional Use of Color With Implications For Industrial Arts Shop Planning.* M. A., Ohio State University, 1947. 117 p.

A study of the principles involved in the functional use of color in painting school shops.

523. BECHER, HAROLD E. (M. S.). *The Methods of Selecting Projects in the General Metals Shop.* The Stout Institute, 1942. 65 p.

An investigation of the methods of selecting projects in junior and senior high schools' general metals shops by means of a survey conducted among industrial arts teachers in Wisconsin.

524. BECKETT, PERCY ROBERT (M. S.). *Industrial Arts and the Activity Program of Elementary Education.* University of Southern California, 1936. 108 p.

This study outlines the industrial arts activities in the elementary school. It compares the programs of segregated and nonsegregated shops, as well as the programs having specially trained industrial arts teachers and those having nonindustrial arts teachers.

525. BENZ, LA VERNE F. *Tool Storage and Tool Control Systems.* M. S., 1952, Stout State College. 118 p. Library, Stout State College, Menomonee, Wisconsin.

Purpose: To obtain, according to practice and preference, a basis for the selection of an efficient and practical type of tool storage and tool control system for senior high school general woodworking areas.

Source of Data: Data were obtained through an inquiry form sent to one woodworking instructor in each high school in Iowa having a total enrollment of over 275.

Findings and Conclusions: The tool panel was the most popular of the types of tool storage facilities in use. A self-service tool control system based on simplicity was regarded as satisfactory. Practices and preferences suggest a variety of methods available to woodworking instructors in planning and initiating a successful system of tool control.

526. BERGLUND, ERICK BERNARD (M. A.). *School Shop Noises.* Ohio State University, 1933.

An investigation of the nature, effects, and reduction of school shop noises in an effort to provide information necessary to maintain a better disciplined school by relieving the strain on the student and the teacher.

527. BJORLIN, MARVIN B. *A Survey of the Physical Facilities of the General Shop in Eastern Iowa.* M. A., 1954, University of Iowa. 6[illegible] p. Library, University of Iowa, Iowa City.

Purpose: To ascertain how selected general shops met the recommendations of the Iowa State Department of Public Instruction

Source of Data: Data were secured by questionnaire and visitation of 41 schools.

Findings and Conclusions: The small schools had poorer facilities, less equipment, less experienced teachers, and offered fewer areas than the larger ones. The consolidation of small schools would help improve the condition of the shops.

528. BRENNAN, THOMAS J. (M.A.). *Development of a General Shop at University Demonstration High School, Morgantown, West Virginia.* West Virginia University, 1957. 58 p.

The needs for a general shop at this school are established, and suggestions are made regarding the methods of developing the general shop at a minimum of expense.

529. **BURKHISER, DONALD M. (M. S.).** *Methods Employed in Care of Tools, Equipment and Supplies by Industrial Arts Teachers in Iowa.* Iowa State College, 1942. 76 p.

An analysis of the methods employed in the care of tools, equipment, and supplies in the shops of schools in towns of 3,000 population and over in Iowa.

530. **CAPPS, HENRY CLAYTON.** *Common Tool and Machine Maintenance Problems of 130 Industrial Arts Departments in Kansas High Schools.* M. S., 1951, Kansas State Teachers College. 86 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the common tool and machine maintenance problems of industrial arts departments in Kansas high schools which could be used in teacher training.

Source of Data: Data were obtained from a questionnaire sent to 130 industrial arts teachers in Kansas and examination of books, periodical articles, pamphlets, catalogs, and circulars.

Findings and Conclusions: Sharpening of edge tools is the outstanding maintenance problem. The hand tool most frequently requiring maintenance is the hand plane; the machine tool is the circular saw blade; the machine is the circular saw. In the maintenance of hand and machine tools, grinding was the outstanding maintenance problem. In the maintenance of machines, lubrication was the most common problem. Inadequate instruction, carelessness and abuse were the basic reasons for most of the causes of maintenance problems.

531. **CARDOZA, FRANK DWIGHT.** *A Survey of the Housing, Layout, and Physical Facilities of Industrial Arts Auto Shops in the High Schools of the North-Central Sacramento Valley.* M. A., 1952, Chico State College. 99 p. Library, Chico State College, Chico, California.

Purpose: To find out whether industrial arts auto shops in the North-Central Sacramento Valley of California meet the specifications in the bulletin, "Guide for Housing and Layout of School Shops in California," and to prepare plans and specifications for an ideal high school industrial arts auto shops.

Source of Data: Data were obtained through observations of eleven high schools in this area using the specifications in the bulletin, "Guide for Housing and Layout of School Shops in California."

Findings and Conclusions: There remained much room for improvement in about half of the shops studied. Instructors were aware of the need and showed evidence of effort to improve facilities. Included is a description of the writer's idea of an ideal high school industrial arts auto shop.

532. **CATE, CHARLES A.** *Acoustic and Other Physical Factors Affecting Classroom Instruction.* M. S., 1953, Illinois State Normal University. 55 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the acoustical conditions of a selected group of representative classrooms in the buildings of Illinois State Normal University and to analyze the possible effects of certain physical properties such as: lighting, color, temperature, and humidity, upon the student.

Source of Data: Data were obtained by an inspection of selected rooms, recordings made in these rooms, and a questionnaire sent to students who had classes in the rooms concerned.

Findings and Conclusions: The newest buildings showed better sound reverberations. Those around a 100 years old were in poor physical condition and acoustics were poor. Students in these rooms may be missing much oral instruction. Lighting was found to be inadequate in many classrooms.

533. **CHRISTENSEN, ERNEST H. (M. A.).** *Factors Affecting the Planning and Organization of an Industrial Arts Shop and Equipment.* State University of Iowa, 1934. 87 p.

A study involving the assembling, organizing, and presenting in sequential order the factors most vital in planning, organizing, and installing the equipment of an industrial arts shop for junior and senior high school.

534. **FAHL, ARTHUR J. (M. S.).** *School Shop Management as a Discipline Preventative.* Pennsylvania State College, 1934. 73 p.

Investigates those factors that make for the least amount of friction in the complete development of the school shop worker. Discusses the relationship between good shop organization and management and desirable disciplinary relations between the student and the school.

535. **FEARHEILEY, RAYMOND R.** (M. A.). *An Analysis of the Organization and Teaching Practice of General Shops in Illinois.* Colorado State College of Education, 1941. 97 p.

A study of general shops in the secondary schools of Illinois to determine current organization and teaching practices.

536. **GORNEY, ALEXANDER ANTHONY, JR.** *Recommendations for Illumination for the Industrial Education Shops.* M. Ed., 1954, Agricultural and Mechanical College of Texas. 65 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To compile information on school shop lighting.

Source of Data: Data were obtained from periodicals.

Findings and Conclusions: Recommendations for illumination of industrial education shops are given.

537. **GRIFFITH, CLYDE EDWARD** (M. S.). *A Study of Light in the Industrial Arts Laboratories of the New Orleans Public Schools.* Louisiana State University and A & M College, 1939. 110 p.

A study of lighting conditions in industrial arts shops built from 1900 to 1939 in New Orleans, with recommendations for certain changes in specific shops to meet minimum accepted standards.

538. **GRIMM, CHESTER A.** *A Proposal for an Exhaust System for the Wood Shops of Kansas State Teachers College, Pittsburg.* M. S., 1951, Kansas State Teachers College. 72 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To investigate the problem of dust and waste materials in the wood shops of Kansas State Teachers College, Pittsburg, and to propose a plan for an exhaust system should the working conditions warrant such an installation.

Source of Data: Data were obtained from a study of statistical reports and information concerning the accepted working conditions in woodworking shops, and standards for controlling and regulating dusty trades were reviewed.

Findings and Conclusions: Shop conditions affect the attitudes of the workers which in turn affects the health and safety of the workers. There is sufficient dust and waste materials produced to justify the installation of a point of operation exhaust system for Rooms 7 and 9 and a separate central exhaust system of the blow-through type should be installed for each room.

539. **HASENAU, J. JAMES.** *Visual Planning of School Shops and Laboratories for College Students.* M. Ed., 1949, Wayne University. 69 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To describe a method of laying out school shops and laboratories using three dimensional models in a scale shop planning arrangeemnt.

Source of Data: Data were obtained from periodicals and books.

Findings and Conclusions: Visual planning is far superior to the mechanical drawing or cardboard templet method. A photograph should be taken as a permanent record when the best arrangement has been decided upon. The shop can be set up using the grid line of the planning board which can be seen in the photograph.

540. **HELSEL, ROBERT W.** *Care of Woodworking Tools and Equipment.* M.S., 1950, Oklahoma Agricultural and Mechanical College. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To describe the procedure and tools required for conditioning some of the more essential woodworking tools and equipment, and; to create an interest among those who are connected with the woodworking program to the end that a better organized plan of teaching "care of Woodworking Tools and Equipment" in industrial arts courses.

Source of data: The library research technique was used.

Findings and Conclusions: The majority of the existing material on care of shop equipment is vague and sometimes misleading. The principles on which the tools are sharpened are very definite. Manufacturers in many instances disagree as to the best approach to the problem.

541. **HEROLD, HENRY DANELLE (M. A.).** *The Metal Trades Exploratory Facilities Present in the Junior High School Automobile Shop.* University of Southern California, 1930. 103 p.

A study of how an auto shop can be converted easily into a general metal shop to widen exploratory facilities. Auto shops and general shops are compared.

542. **HETH, MARY ELEANOR (Masters).** *Evaluation of Pottery Equipment and Scientific Study of Glazes for Amateur Potters.* Wayne University, 1939.

543. **HIBLER, HERBERT QUINLIN.** *Shop Layouts and Course Requirements For Trade Shoe Rebuilding.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 55 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a plan for trade shoe rebuilding shops to facilitate the daily teaching program, and to develop course requirements essential to teaching the trade.

Source of Data: Data were obtained by questionnaires from four Oklahoma cities, and by interviews with a number of teachers of shoe rebuilding.

Findings and Conclusions: Where possible, the vocational course in shoe rebuilding should be offered in Negro High Schools during the junior and senior years. Adequate information should be included as to cost of materials, pricing, customer relations, care of equipment, economy of materials, work habits, stock and supplies and inventory practices.

544. **HILL, LAURENCE ALVIN (M. S.).** *Time Efficiency Analysis of Industrial Arts Tool Systems in Junior High Schools.* Iowa State College, 1936. 70 p.

A study comparing the efficiency, from a time-economy standpoint, of three different tool storage practices: tool-kits, tool-panels, and tool-rooms. Eighteen shops in eleven middle-western schools were studied.

545. **HINTZ, E. H. (M. S.).** *Shop Planning and Machine Equipment for a Unit Woodwork Shop in an Industrial Arts Program for the Senior High School at Rockford, Illinois.* The Stout Institute, 1940. 43 p.

A unit woodwork shop plan for use in a high school, based on interviews and questionnaire surveys of twenty-two woodwork instructors in attendance at The Scout Institute, Menomonie, Wisconsin, in 1940.

546. **HOLT, JAY F.** *A Study of the Physical Means of Improving the Visibility in the Drafting Department of Wyandotte High School.* M. Ed., 1950, Agricultural and Mechnical College of Texas. 21 p. Department of Industrial Education, Agricultural and Mechnical College of Texas, Arlington.

Purpose: To study the conditions of visibility in the drafting room of Wyandotte High School in Kansas City, Kansas, and to compare these conditions with the recommendations of the American Standards Association and other authorities.

Source of Data: Literature on visibility in drafting rooms was studied, and the foot-candles of light in the drafting room at Wyandotte High School were measured. By using the criteria of authorities proper installations were recommended.

Findings and Conclusions: Present room lighting conditions do not meet the criteria of authorities. Fluorescent lamps of a specified design would increase the quantity of light to the 75–00 foot-candles needed.

547. **HUDSON, CHARLES P. (M. A.).** *Methods of Administering Shop Supplies and Equipment.* Colorado State College of Education, 1935. 72 p.

A survey of how industrial arts teachers of twenty-five states administer shop supplies and equipment. The general shortcomings of many programs are noted.

548. **HUGDAHL, E. V. (M. S.).** *A Woodfinishing Cost Table—A Practicable Method of Computing Actual Cost of Finishing Materials Used by Any Student in the School Shop.* The Stout Institute, 1941. 54 p.

Using information from several paint companies, the author set up a simple table for computing woodfinishing costs. Application of the system may have significance to the student in preventing slip-shod handling of finished materials.

549. **JUDD, HUNTER L.** ***Maintenance of General Woodworking Tools and Equipment in the School Shop.*** **M. Ed., 1950, Wayne University. 25 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To present the best practices in the maintenance of tools and equipment in general woodworking shops.

Source of Data: Data were obtained from a review of published materials and interviews with men in the field.

Findings and Conclusions: Courses of study should be set up to train students in maintenance of tools and equipment in the school shop. Routine inspection system should be used, and an adequate system of checking out tools to avoid loss should be developed. All tools and equipment should be kept in their most efficient condition to insure best operation of the shop.

550. **KETTERLING, HARLEY EDWIN.** ***Design for an Improved Demonstration Area.*** **M. Ed., 1951, Colorado Agricultural and Mechanical College. 62 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.**

Purpose: To plan the equipment and facilities for an improved industrial arts demonstration area.

Source of Data: Data were obtained by a check list from Colorado Agricultural and Mechanical faculty, and industrial arts teachers attending graduate school at the institution.

Findings and Conclusions: Eighty per cent of industrial arts instructors would be satisfied with a demonstration table 36" x 72", 32" high, equipped with wood and metal vises, outlets for water, gas, compressed air and electricity, and adequately lighted. Blackboards providing adequate writing space, a chart holder, and projection screen should be included in the demonstration area. Individual seats with fixed writing surfaces, should be provided for students observing the demonstration.

551. **KING, DAVID H.** ***Tool and Supplies Storage and Issuance Methods.*** **M. S., 1952, Illinois State Normal University. 49 p. Library, Illinois State Normal University, Normal.**

Purpose: To ascertain the preferred method of storing and issuing tools and supplies as recommended by industrial arts teachers with master's degrees in Illinois outside of Cook County.

Source of Data: Data were obtained from questionnaires sent to 189 industrial arts teachers with master's degrees.

Findings and Conclusions: The area tool panel should be used in industrial arts classes. Students should have free access to tools, and each student should be responsible for the tools he uses. Students should be held in class until all tools are checked for loss and damage. Supplies common to the woodworking area should be stored so that the students have free access to them with the exception of hardware, sandpaper, sanding belts, lacquer, and solvents, which should be issued by the teacher. The supplies commonly used in the metal area should be issued by the teacher with the exception of welding rods, machine screws, steel wool, band steel, rivets, and flux, which should be issued by a student supply clerk.

552. **KING, MARVIN D.** ***A Study and Evaluation of the Lighting in the Industrial Arts Shops of the Fort Worth Public Schools.*** **M. S., 1951, North Texas State College. 106 p. Library, North Texas State College, Denton.**

Purpose: To evaluate the lighting in the industrial arts shops of the public schools of Fort Worth, Tex.

Source of Data: Data were obtained by the use of check sheets, actual light measurements taken in the shops, and books.

Findings and Conclusions: The shops have to depend on artificial lighting most of the time, especially on cloudy days. The bulb wattage in most of the shops was not adequate.

553. **KOLASA, MARION J.** ***Contaminant Control and Make-Up Air for School Welding Shops.*** **M. Ed., 1955, Wayne University. 33 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To provide school welding shop teachers with a ready source of most recent data on recommended contaminant control and make-up air in a school welding shop.

Source of Data: Data were obtained from industrial hygiene research, The Welding Handbook, Heating and Ventilating Guide and Journals, Industrial Ventilation Manual, and individuals active in the field of industrial ventilation.

Findings and Conclusions: The most important single avenue to better atmospheric sanitation lies in education of the shop welding teachers so that the basic elements of contaminant control are part of their know-how.

554. **LANNERS, LeROY D.** *School Shop Management.* M. A., University of Minnesota, 1945. 76 p.

A review of the literature on school shop management.

555. **LATTIMER, RICHARD B.** (Masters). *Pupil Personnel Organization in the Industrial Arts Classes.* Wayne University, 1941.

556. **LEAF, ELMER MAYNARD** (M. S.). *A Survey of Present Practices in Shop Planning, with Recommendations for Organizing Small Secondary School Shops.* Oregon State College, 1939. 135 p.

A survey of industrial arts facilities constructed or remodeled within the five year period prior to 1938, in communities with a population of 1,000 to 5,000. A comparative survey is made of the opinions of supervisors, administrators, and teacher-education.

557. **LIGHTFOOT, PRESTON CLIDE** (M. A.). *A Survey of Housing Equipment and Materials Used in the Industrial Arts Departments of the Los Angeles Junior High Schools.* University of Southern California, 1932. 278 p.

A study of the existing housing and materials situation in industrial arts departments in Los Angeles, with particular reference to certain criteria set up by the recommendations of educators, teachers, etc.

558. **LUNDGREN, HERBERT R.** (Masters). *A Study of the Location of Industrial Arts Laboratories in the Class 'A' High Schools in the State of Kansas.* Ohio State University, 1933.

559. **LUTHER, CLAYTON C.** (M. A.). *Chalkboard Considerations in Planning a New Classroom.* Wayne University, 1948. 119 p.

An historical study to present information and suggestions regarding the size, color, material, position, and lighting of chalkboards.

560. **MALEY, DONALD** (M. A.). *Acoustics in the Industrial Arts Shop—A Study of Noise Factors and Principles for Appraising the School Shop for Noise Control.* University of Maryland, 1947. 147 p.

Sound tests were taken of various school shops to determine the noise factor and to arrive at some criteria by which one may evaluate an industrial arts shop with regard to noise control.

561. **MANSPERGER, DALE E.** (M. A.). *The Pupil-Personnel Organization—A study of its Development, its Operation and its Results in a Laboratory of Industries.* Ohio State University, 1933. 263 p.

This thesis proposes and defends the proposition that a shop cannot be operated effectively without a personnel organization composed of the pupils enrolled in the class.

562. **MATTHEWS, ALLEN M.** *Adequate Lighting for the School Shop.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 66 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To offer recommendations in which lighting conditions may be improved in the industrial arts classrooms of today.

Source of Data: Compilation of information and material from various books and periodicals.

Findings and Conclusions: A fully qualified lighting specialist would be able to determine the most suitable form of lighting which should be used to harmonize with the architecture of the building. Careful study should be made in planning public school buildings to meet the standards established by the American Recommended Practice of School Lighting.

563. **McAFEE, GEORGE E.** (M. S.). *Lighting Conditions in Fifty School Drafting Rooms of the Chicago Area.* Iowa State College, 1935. 73 p.

An investigation of fifty different drafting rooms in Chicago high schools to determine the lighting conditions.

564. **McCAIN, JERRY CLAY.** *To Determine and Evaluate Practices That are Used in Classdoom Activity Involving the Correction or Prevention of Discipline Problems.* M. S., North Texas State College, 1940. 48 p.

A discussion of autocratic vs. democratic methods of handling disciplinary problems.

565. **NEAD, PERRY E.** (Masters). *Supplies for Industrial Arts Laboratory.* Ohio State University, 1943.

566. **PARENT, LEO C.** *Development and Description of a Tool Inventory System for Industrial Arts Shops.* M. Ed., 1954, Wayne University. 35 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To plan, develop and describe a tool inventory system for industrial arts shops.

Source of Data: Data were obtained from shop instructors, professional books, research reports, periodicals, pamphlets and magazine articles.

Findings and Conclusions: Due to the importance of inventory systems in school shop instruction, it is imperative that teachers strive to familiarize themselves with the most recent methods and techniques developed for recording inventory information.

567. **PORTER, BERNARD ROBERT.** *Methods of Student Management Employed in Teaching Large Junior High School Woodwork and Metalwork Classes.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 68 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the most successful means of managing junior high school shop classes.

Source of Data: Questionnaire suggesting management schemes were sent to 132 industrial arts teachers, 100 replied.

Findings and conclusions: The "teacher as general manager" was employed by 65 percent of the teachers having large classes. The "teacher as foreman" was found next most successful.

568. **PRINE, VIRGIL HERMAN.** *Industrial Arts Policies in Illinois High Schools with Enrollments of 100 to 1800.* M. S., 1950, Iowa State College. 78 p. Library, Iowa State College, Ames.

Purpose: None reported.

Source of Data: The study was based upon industrial arts policies practiced in Illinois high schools having enrollments of 100 to 1800 students. These schools were divided into two groups. The study was started in June, 1949, and terminated in August, 1950.

Findings and Conclusions: There is a need for more general agreement in the management and organizational policies in industrial arts. Industrial arts teachers should become more aware of the part that management and organizational policies play in developing the objectives of industrial arts education.

569. **RAWLINS, CHARLES W. (M. S.).** *The Status of Lighting in Some School Shops in Ohio and Recommendations for Improved Lighting.* Ohio State University, 1940. 112 p.

An analysis of some studies in lighting in an effort to determine the amount of light recommended for school shops. The amount of light at the various stations in a school shop was measured and a means of measuring the desired amount of light at each station was devised.

570. **RITTGERS, JAMES FRANKLIN (Masters).** *A Comparison of the Methods of Drying Lumber for School Shop Use.* Ohio University, 1938. 52 p.

571. **SCHLARTT, ROBERT EARNEST (M. A.).** *A Study of Classroom Lighting.* Southwest Texas State Teachers College, 1947. 46 p.

A study of thirty classrooms, including nine industrial arts laboratories, in Texas. Facts on lighting conditions are presented and specific ways to improve lighting of school shops are suggested.

572. **SCHWANZLE, RUDOLPH L. (Masters).** *Graphic Analysis of Organization Problems in the Laboratory of Industries.* Ohio State University, 1931.

573. **SCOTT, RUSSELL PERRY.** *Methods Employed by Oregon High School in Checking and Maintaining Shop Tools.* M. S., 1949, Oregon State College. 76 p. Library, Oregon State College, Corvallis.

Purpose: To study the systems of tool storage, checking and maintenance used by industrial arts teachers in the secondary schools of Oregon.

Source of Data: Limited survey through personal visitation, supplemented by a questionnaire survey to schools beyond the scope of personal visitation.

Findings and Conclusions: The method of tool control is not so important as making the system functional. Success in tool and machine control and maintenance depends upon the ability and personality of the instructor more than it depends upon the method used.

574. SEVCIK, ANTON M. ***The Need For Cooperative Planning of Industrial Arts Shops.*** **M. Ed., 1952, Agricultural and Mechanical College of Texas. 27 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.**

Purpose: To ascertain the inadequacies of present industrial arts shops, to determine the reasons for these inadequacies, and to show the need for cooperative shop planning.

Source of Data: Data were obtained from books, periodicals, and unpublished materials.

Findings and Conclusions: The industrial arts teacher can and must take the lead when planning the physical layout of the shop. The problems of heating, ventilation, lighting, structural design, and color scheming should be left to the architect, with suggestions from the industrial arts teacher. Present concepts of shop planning must be constantly revised to keep pace with new developments.

575. SEYMOUR, STANLEY R. ***A Three-dimensional School Shop Planning Kit.*** **M. A., 1954, Chico State College. 23 p. Library, Chico State College, Chico, California.**

Purpose: To design and construct a three-dimensional school shop planning kit.

Source of Data: Data were secured from published materials, a study of school shops, and interviews with teachers.

Findings and Conclusions: The report gives a picture and a description of the unit, together with suggestions for its use in shop planning.

576. SHUCK, ROBERT E. ***Color Dynamics: Its Implications for Industrial Arts Laboratories.*** **M. A., 1950, Ohio State University. 221 p. Education Library, Ohio State University, Columbus.**

Purpose: To show how color dynamics may be used in industrial arts laboratories.

Source of Data: Approximately 100 books were reviewed in an effort to determine the science of color and the theory of light and other aspects of color. Literature distributed by leading paint companies was reviewed and case histories of the use of color in industrial plants analyzed.

Findings and Conclusions: Sufficient data were found to warrant the use of color in industrial arts laboratories. Proper lighting is essential to any color conditioning program; light and color team up to make ideal working and learning conditions. Light produces the necessary brightness contrast and results in better seeing; color produces the necessary color contrast, eliminates glare and makes for less monotony. Ideal working conditions may be developed in the industrial arts laboratory whereby maintenance, safety, morale and efficiency will reach a new high and fatigue a new low.

577. STEMPLE, JAMES E. ***Lighting in the Industrial Arts Shop.*** **M. Ed., 1952, University of Maryland. 48 p. Industrial Education Department, University of Maryland, College Park.**

Purpose: To ascertain what constitutes good lighting and make recommendations for lighting in industrial arts shops.

Source of Data: Data were obtained from a survey of materials on lighting, authorities in education, health, manufacturing, and color dynamics and from a survey of lighting in the industrial arts shops in Arlington County, Virginia.

Findings and Conclusions: Only one shop of those surveyed was found to be adequately lighted, commensurate with shop requirements. Recommendations are made for improving the conditions found.

578. STERNHOFF, G. E. (M. S.). ***Methods of Storing Woodworking Project Materials in the Industrial Arts Laboratory.*** **Iowa State College, 1940. 107 p.**

A survey of 253 city directors in industrial arts and vocational education and directors of industrial education in teacher training institutions to determine the best practices of storing woodworking project materials in the industrial arts laboratory.

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579. STEVENSON, JAMES E. ***Shop Management in Industrial Arts Teacher Preparation.*** **Ed. D., 1953, Stanford University. 184 p. Library, Stanford University, Stanford, California.**

Purpose: To analyze shop management into its component parts, and to examine their importance in shop teaching; to examine the program of teacher training in industrial arts at San Jose State College to discover the extent to which elements of shop management are dealt with in this program to examine competency of students and graduates of this program; to ascertain effectiveness of the program in this area; and, to discover weaknesses in the program and make recommendations for its improvement.

Source of Data: Data were obtained from 22 senior students in industrial arts, 67 student teachers, 128 graduates who had taught from one-half to 5 years, and staff members of the Industrial Arts Department, San Jose State College. Tests were administered to seniors and student teachers. A rating scale was used to rate performance of student teachers and graduates on the job.

Findings and Conclusions: The Industrial Arts Department of San Jose State College should clarify differences between expendable supplies, hand tools, and fixed shop equipment; stress the importance of shop cleanliness and orderliness to shop teaching; give greater attention to maintenance and repair of equipment, operation of shop tool cribs, shop safety programs, method of handling supplies and materials, and the preparation of annual shop orders for tools and materials; include more adequate coverage of procedures for shop budgeting and bookkeeping systems; and provide teacher candidates with ample samples of graded shop projects, require student teachers to design and produce various teaching aids during student teaching periods, and require student teachers to assume responsibility for attractive appearance of shop in which student teaching is done.

580. STONER, THEODORE F. *Types of Floor Materials Most Desirable for Industrial Education Laboratories.* M. Ed., 1949, Wayne University. 25 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To examine the various types of floor covering used in school shops, with the view of learning their relative merits for different uses.

Source of Data: Data were obtained from literature on the subject and from a questionnaire.

Findings and Conclusions: Maple floors are best for all shops except for aeronautics, welding, auto mechanics, and brick laying; in these shops cement should be used.

581. SUHLING, AUGUST F. (M. S.). *The Efficiency of Student Printers in Hand Composition Under Various Light Intensities.* Iowa State College, 1935. 67 p.

A study to determine the light intensity required for an adequate illumination system in the hand composition department of the print shop of the Delgado Central Trades School of New Orleans, Louisiana.

582. TAYLOR, BYRON M. *Organization of the Industrial Arts as Objectified by an Electric Shop.* M. A., Claremont Colleges, 1934. 101 p.

A report of the way San Diego schools organized the industrial arts electric shops in that city.

583. TROGDON, GLENN ODELL. *Some Factors in Purchasing Supplies for an Industrial Arts Department.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 80 p.

A study of problems and procedures in purchasing and financing school shop supplies.

584. WEHRWEIN, HARLEY F. *The Application of Modern Industrial Personnel Management Practices to Industrial Art Classes.* M. S., 1949, The Stout Institute. 107 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To provide a guide and supply up-to-date information to aid industrial arts instructors toward more efficient teaching and more profitable student experiences in pupil-personnel plans, to make a directive to guide industrial arts instructors in planning a more effective program through emphasis on better personnel relations.

Source of Data: The method of research used was a review of the latest literature in the field, statistically analyzed by documentary frequency.

Findings and Conclusions: The study suggests industrial counselling concepts, grievance procedures, testing programs, safety and accident programs, teaching techniques, and personnel-recording devices which could be applied to industrial arts personnel organizations. The writer recommends that: any personnel plan should be thoroughly explained to the student, and the instructor should spend considerable time in study and preparation before attempting to put the plan in operation; every instructor do his best to counsel students, if trained personnel is unavailable, and to develop counselling techniques similar to those suggested in this study; some form or plan of grievance procedure be introduced in every school shop; all industrial arts departments have a testing program; all industrial arts departments incorporate a safety and accident program in their personnel plans similar to the proposed plan in this study; and every instructor develop teaching techniques similar to those suggested in this study.

585. WICHAR, STEPHEN MICHAEL. *The Model Shop for Industrial Arts in a Typical Detroit Elementary School.* M. Ed., 1954, Wayne University. 48 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To analyze and evaluate industrial arts shops planned by supervisors and teachers in cooperation with the Architectural Office in Detroit.

Source of Data: Data were secured by questionnaires, books, magazines, and personal visitations.

Findings and Conclusions: The basic plan was not consistent. More functional shop equipment and layout arrangements are needed. Further research is needed to reveal significant facets of planning new shops.

586. WILSON, JESSE J. *Finishes and Finishing in the Industrial Arts Shops of Kansas High School.* M. S., 1951, Kansas State Teachers College. 157 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To make a comprehensive study of the development of the common finishes, methods, and procedures followed in the application of finishes, equipment, and processes; and the finishing conditions in the industrial arts shops of Kansas.

Source of Data: Data were secured by personal letters, personal interviews, questionnaires, and reference readings.

Findings and Conclusions: Finishing facilities were not as adequate in the smaller schools as in the larger ones. Oil stain was most frequently used. Over one-half of the shops had finish rooms separate from the general shop. Practically all the common finishing materials were kept in stock. Very few finishing areas had suitable storage spaces for projects undergoing the finishing process. The methods used in charging for finish materials were not considered satisfactory. The most frequent method of applying finish was with a brush. Turpentine was the principle method of wet storage for brushes. The most commonly used of the newer finishes was "Res".

587. WITT, EDWARD H. (M. A.). *Physical Aspects of Industrial Arts Departments.* University of Minnesota, 1933. 91 p.

This analysis of architect's plans and specifications points up the need for a careful study of requirements prior to building and a more adequate understanding of what should be included in an industrial arts department. Use was made of actual plans and specifications on record in the Minnesota State Department of Education.

588. WRIGHT, WELCOME E. (M. S.). *An Analysis of the Lighting and Ventilation of Industrial Arts Laboratories in East Texas.* A & M College of Texas, 1939. 75 p.

A study revealing existing weaknesses and offering suggestions for lighting and ventilating systems. The study is based on a physical survey of thirty-six schools in Texas, made in 1939.

Guidance

General

589. ASLINGER, ELMER N. (M. S.). *Characteristics of Elective Shop Boys, Knoxville Junior and Senior High Schools.* University of Tennessee, 1933. 88 p.

An analysis of the characteristics of those boys taking industrial arts courses as elective subjects in 1933, with emphasis on determining the mentality of the students, the age group, and the occupations of the parents of such students.

590. BARDWELL, VIVIAN MARINOFF. *Survey of Recent Periodical Literature (1940–1948) on Vocational Interests Applicable to the High School Guidance Program.* M. P. S., University of Colorado, 1948. 235 p.

Reviews 124 articles pertaining to vocational interest. Each article is condensed as an objective reflection of the author's presentation rather than a critical analysis. Some basic conclusions are formulated concerning theories of interest, available measuring instruments, and significance of vocational interests in high school guidance.

591. BEGEMAN, WARREN K. (M. S.). *Why Pupils Withdraw from the Hadley Technical High School and Pro-*

posed Remedies. Colorado Agricultural & Mechanical College, 1941. 138 p.

A study to discover why students were leaving the school despite its reportedly fine guidance program, modern curriculum, parent-teacher meetings, and other attractive aspects. The conditions drawing students away from the school are analysed.

592. BEMIS, JANE S. (Masters). *Vocational Needs and Interests of Out-of-School Girls in the Union School in Yuma, Colorado.* Colorado A & M College, 1939.

593. BROWE, R. C. *Home Room Guidance in the Capital Hill Junior High School of Oklahoma City, Oklahoma.* M. S., The Stout Institute, 1943. 49 p.

A suggested program for home room guidance in the junior high school. Lists of discussion topics are given, arranged in order of importance.

594. BROWN, CARL W. (M. Ed.). *Labor Market Problems of the Drop-outs from the Hadley Technical High School.* Colorado Agricultural & Mechanical College, 1947. 95 p.

A study of the employment problems of the school drop-outs for the school year 1946–1947. Reasons for the drop-outs and remedies to overcome these conditions are offered.

595. BROWN, DEAN T. (M. S.). *Co-ordination of Guidance Services—A Guidance Plan for Secondary Schools Co-ordinated with Schools of Vocational and Adult Education in Wisconsin.* The Stout Institute, 1946. 86 p.

A survey of 377 Wisconsin secondary schools through the Guidance Director of the State Department of Public Instruction to determine present day practices in guidance. A guidance plan co-ordinated with the state schools of vocational and adult education is offered.

596. BROWN, ORAN I. (M. A.). *Survey of Vocational Choosing.* Indiana State Teachers College, 1935. 44 p.

A study based on 1,927 interviews of men and women who have been successfully engaged in seventy-three occupations for a period of five years or more, to determine the age level at which the individuals made their vocational choice.

597. BYRD, JAMES ALEXANDER (M. A.). *A Study of the Vocational-Industrial Interests of Negro Boys in the Secondary Schools of Dayton, Ohio.* Ohio State University, 1932. 95 p.

A study of vocational-industrial interests of high school Negro boys of Dayton, Ohio, in 1932. An attempt is made to compare aptitudes with interests through the use of tests.

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598. CAMBRIA, SOPHIA T. (Doctors). *Youth in Philadelphia Labor Market: A study of the Vocational Problems of Young Workers and Related Vocational Services.* Bryn Mawr College, 1945.

599. CARLSEN, DARVEY E. (M. S.). *Co-ordination of Guidance Services—A Guidance Plan for Schools of Vocational and Adult Education Co-ordinated with Secondary Schools in Wisconsin.* The Stout Institute, 1946. 87 p.

By means of a questionnaire sent to the Wisconsin Vocational Schools through the State Board of Vocational and Adult Education, the writer determined the extent of guidance services in Wisconsin vocational schools. A seven-area guidance plan, including: administration, co-operating agencies, tests, cumulative records, pre-enrollment counseling, occupational information, and placement and follow-up, is proposed.

600. CONNOR, SISTER MARY. *A Vocational Guidance Program for Sacred Heart of Mary High School.* M. A., 1949, University of California. 120 p. Graduate Reading Room, University of California, Los Angeles.

Purpose: To show how vocational guidance began as a formal program, why it is important today, and why it is necessary to Sacred Heart of Mary High School.

Source of Data: Descriptive summary of the history and significance of vocational guidance and a proposed plan for Sacred Heart of Mary High School.

Findings and Conclusions: A plan for the guidance program for the high school in question is developed in some detail, emphasizing a well-rounded combination of academic and vocational education and guidance. It will aim for a broad type of education which will enable the student to meet the problems of a modern changing world.

601. COX, CHARLES W. (M. S.). *Fundamental Employment Characteristics of the Metal Trades Industries in the San Francisco Bay District of California.* **Colorado Agricultural & Mechanical College, 1940. 159 p.**

An investigation of reasons for employee success or failure in industry. It aims to provide a means of analyzing employee needs in terms of employment assets and to determine the nature of remedial training for the unemployed.

602. CROMWELL, ESKIN EMIL (Masters). *Value of Trade Training Given in Hammond Technical-Vocational School as Indicated by Reports from 150 Former Students.* **University of Chicago, 1934.**

603. CROSS, LLOYD VERNON. *An Educational and Vocational Survey of the Graduates of Norfolk High School for the Years 1935–1939.* **M. A., University of Michigan, 1942. 86 p.**

A study to determine the effectiveness of the present guidance practices of the Norfolk Public Schools with respect to the contributions made toward successful training for making a living.

604. CURRY, WILLA CLOTHILDE (M. A.). *Educational and Vocational Guidance of Negroes.* **University of California at Los Angeles, 1939. 119 p.**

This study considers the guidance opportunities and the training available to Negroes in Los Angeles from 1928 to 1935. Placement facilities, available occupations, and nonschool organization of Negroes are discussed.

605. DELL, S. M. (M. S.). *The Function of the Industrial Arts Teacher in the Guidance Program of the High Schools of Kansas.* **Iowa State College, 1934. 36 p.**

An investigation of the guidance programs in 137 schools in Kansas. Topics include administration; qualifications of counselors; techniques used to discover abilities interests, and aptitudes; methods of guidance; and ratings of various departments.

606. DUDDERAR, CHARLES W. (M. A.). *What Becomes of the Trade School Check-out?* **University of Maryland, 1941. 89 p.**

A survey of the check-outs from a vocational school in Baltimore, Maryland, during 1936–39, to investigate the reason for withdrawal, present employment status, ratings, and wage facts, etc. Conclusions for curriculum revision and guidance services are suggested.

607. DUMAS, ALEXANDER A. (M. A.). *Employment Opportunities for Negro Male High School Graduates in the District of Columbia, 1948.* **Catholic University of America, 1948. 95 p.**

A study of the industries of Washington, D. C., to determine the best opportunities for the Negro youth of the city. It offers direction toward the guidance of these youth for the vocations which offer the greatest opportunities.

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608. FEATHER, DON B. *The Relation of Personality Maladjustment of Five Hundred Three University of Michigan Students to Their Occupational Interests.* **Ph. D., 1949, University of Michigan. 146 p. Education Library, University of Michigan, Ann Arbor.**

Purpose: To ascertain the relationship between measured personality traits to occupational interests.

Source of Data: Five hundred and three students at Michigan, mostly veterans, who were consecutively counseled at the Bureau of Psychological Services, were administered the Minnesota Multiphasic Personality Inventory and the Kuder Preference Record. For the Multiphasic, a T Score of 70 or more was considered maladjusted; while on the Kuder the 75th percentile was adopted as the level of significance. Finally, a modified Fisher t formula was devised to test the differences between the occupational interests of the normal and maladjusted individuals.

Findings and Conclusions: The foregoing procedure revealed that the students in question who had personality maladjustments as previously defined were more apt to have occupational interests which fall within the Kuder range of significance in the literary, musical, and artistic areas than those who had normal profiles on the Multiphasic and were less apt than the latter to have interests in the mechanical and scientific areas. The author also indicated that the significance of these findings for counselors, and suggested further research as an outgrowth of this investigation.

609. FINSTERBACH, THOMAS WILLIAM (M. S.). *A Study of the Retention of Students in Industrial Vo-*

cational High Schools. Cornell University, 1940. 83 p.

A study of 11,800 students enrolled in 150 trade classes of four schools in the city of Buffalo, New York, during the period 1927–1940 to determine the changes schools need to make in order to retain their students and meet students' needs.

610. FOX, FORREST LEONARD. *Vocational Guidance in Industrial Arts.* M. A., 1952, Sam Houston State Teachers College College. 121 p. Library, Sam Houston State Teachers College, Huntsville, Texas.

Purpose: To provide information regarding pupils' needs for and teachers' responsibilities in vocational guidance.

Source of Data: Data were secured by questionnaire and from library materials.

Findings and Conclusions: An effective guidance program requires the cooperation of the school and community. A good industrial arts program does much to enhance the vocational guidance program.

611. FRICKE, EMMETT WALTER. *Pupil Interest in Industrial Arts Subjects in the Sioux City (Iowa) Junior High Schools.* M. S., 1949, Iowa State College. 65 p. Library, Iowa State College, Ames.

Purpose: To determine the relative interest values of the various subjects offered in the industrial arts program in the junior high schools.

Source of Data: All boys in the 4 junior high schools were asked to fill out questionnaires covering their industrial arts interests over the 3-year period, seventh to ninth grades.

Findings and Conclusions: Woodworking ranked first in interest, mechanical drawing last. Many courses were weak in proper motivation. Interest tended to go along with teacher's interests and personality rather than with subjects. The teacher makes or breaks the course.

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612. GELINAS, PAUL JOSEPH. *A Vocational Guidance Program for Supervisory District Number 2, Suffolk County, New York.* Ed. D., 1954, New York University. 170 p. Library, New York University, New York.*

Purpose: To find desirable vocational guidance policies and practices which may operate in a cooperative program. To recommend procedures by which such a program may be established in some small schools in the State of New York.

Source of Data: Data were secured by a survey of all cooperative vocational guidance programs in New York State and their evaluation on a five point scale by directors of guidance and school administrators. Criteria of a vocational guidance program were developed.

Findings and Conclusions: Small schools are in a position to introduce, through the help of citizens' committees, a vocational guidance program suited to and desirable for small communities at a reasonable cost to the taxpayers. Such a program was developed as part of this study.

613. GOLDSTEIN, HYMAN. *The Administration of and the Advisement and Guidance of the Veterans Administration Program in New Jersey.* Master of Public Administration, 1948, New York University. 70 p. Library, New York University, New York.

Purpose: To review the growth and development of the New Jersey Veterans Administration Regional Office from the end of World War II up through 1947.

Source of Data: The study surveys the Veterans Administration procedures and laws as they relate to the disabled veteran and the non-disabled veterans including its administrative machinery and recommendations relative to the Advisement and Guidance Division procedure in New Jersey. Utilizing the Guidance Center as a starting point, the study analyzes its concepts, regulations and services to all veterans of World War II.

Findings and Conclusions: Several recommendations emerge as a result of the study. Termination of college operated guidance centers; concurrent expansion of existing Veterans Administration guidance facilities to absorb this work. Interim operation of school-operated guidance centers; staffed by not more than one vocational advisor; school staffs to handle the clerical work. Decentralization of operations and centralization of control; existing physical properties to be used to the maximum consistent with service to veterans. Close physical proximity between the training section and the advisement and guidance sections in each area office. Consolidation of forms, records and reports without interference with service to veterans. More effective utilization of personnel; reclassification; promotions; job training. The study points up the advisement and guidance program as successful and emphasizes the danger to the program by severe reductions in personnel force, occurring at the time the study was completed.

614. **GOVATOS, LOUIS A.** *A Study of the Vocational Choices of High School Freshmen and Seniors.* M. A., University of Michigan, 1948. 100 p.

A study to determine to what extent students of the Midland (Michigan) High School have made definite vocational choices.

615. **GRAVEL, WALTER EDWARD (M. S.).** *Vocational Guidance Training and Employment of Young Men in Mascontah, Illinois.* Iowa State College, 1940. 75 p.

A survey of 106 young men between the ages of sixteen and twenty-five not enrolled in a regular high school or college to determine their relationships to employment situations in Mascontah and the surrounding community.

616. **HAINER, LINTON (M. A.).** *Engineering Preparation, High School and College. The Value of High School Shop and Drawing Courses as a Basis for Work in Engineering Colleges With Attention to Both Guidance and Training Aspects.* University of Minnesota, 1936. 62 p.

An analysis of the St. Paul and Minneapolis High School and Vocational School graduates who entered and graduated from the Colleges of Engineering and Architecture, University of Minnesota, in an attempt to fit college engineering work and secondary school shop and drawing work into an articulated program.

617. **HAKENEN, CARL ARTHUR.** *A Study of the Vocational Choices of the Seniors of Central High School, Bay City, Michigan.* M. A. in Ed., University of Michigan, 1940. 66 p.

The study covered such factors influencing choice of vocation, as home, school activities and curricula, counselor, teacher and advisor, purpose and aim in life, and civic and business leaders. In addition, 131 evaluations by students of guidance program are reported verbatim.

618. **HALL, CHARLES A. (M. S.).** *The Need For Occupational Guidance for the Boys of the Sam Houston Senior High School, Houston, Texas.* A & M College of Texas, 1938. 68 p.

A study of occupational choice of boys employed part-time and enrolled in the Sam Houston Senior High School, Houston, Texas, 1938. The need for vocational guidance is indicated.

619. **HERRING, ARTHUR B.** *Success of 209 Graduates of the Houston Public Schools on the Basis of Their Wages and Increases in Wages.* M. S., 1951, North Texas State College. 64 p. Library, North Texas State College, Denton.

Purpose: To make a comparative analysis of the success, based on wages and increases in wages, of 209 students.

Source of Data: Data were obtained from records in the Registrar's Office, Director of Curriculum, Director of Industrial Arts, and from questionnaires sent to selected high school graduates.

Findings and Conclusions: Graduates with Type "B" vocational training earned higher wages than students without such training. The rate of increase in wages was greater for the vocationally trained graduate.

620. **HURLEY, JOHN RANDOLPH (M. A.).** *The Vocational Adjustments of Continuation School Students.* University of Southern California, 1933. 88 p.

A study concerning continuation school students in terms of their educational status as they enter industry, their vocational aims, age of leaving school for employment, extent of economic necessity for leaving schools, and the nature of the occupations they enter.

621. **HUTCHINSON, WILLIAM LLOYD.** *Vocational Adjustments of Men Graduated From Granite High School.* M. S., University of Utah, 1948. 73 p.

An analysis of the male graduates of Granite High School, Utah, from the classes of 1943 and 1944, showing what they did after graduation and problems of adjustment in all areas.

622. **JADWIN, GLEN D.** *Turnover of General Industrial Teachers in Minnesota, 1930–1935.* M. A., University of Minnesota, 1938. 49 p.

A study of turnover of industrial arts teachers of Minnesota through a 5-year period for purposes of guidance, preparation, and placement.

623. **JONES, MELTON H.** *A Comparative Study of Reimbursable Guidance Programs in the Various States.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 27 p. School of Trade and Industrial Edu-

cation, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To analyze and compare the various state guidance programs and plans for local supervision in the different States under the provisions of the George-Barden Act.

Source of Data: Data were taken from the State Plans for vocational guidance from several States which submitted material. Letters were sent to the State Directors of Vocational Education of 44 States and Territories. Thirty-four States sent material which pertained to the guidance program.

Findings and Conclusion: All States require the local supervisor to have a bachelor's degree. All States require teaching or counseling experience of from 1 to 3 years. Counselor trainers in all States except one are required to have graduate work, and required teaching experience ranges from 2 to 3 years, occupational experience from 0 to 3 years. All State Plans specify that the State Board for Vocational Education shall assume responsibility for providing training for counseling. Only a few States are taking advantage of the provision for reimbursing guidance programs under the George-Barden Act.

624. **KAFRISSEN, DAVID S. (Masters).** ***A Study of Boys Now in Industrial Auto Mechanics at John Bertram High School.*** **University of Pennsylvania, c. 1935–47.**

625. **KENNEDY, GEORGE R. (M. S.).** ***The Dispersion of Graduates of a Chicago Technical High School.*** **Colorado Agricultural & Mechanical College, 1934. 107 p.**

A study to determine from the occupational choice of technical school graduates if technical schools are of value to a community.

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626. **KOHL, ERNEST O.** ***A Study of the Factors Which Influence Pupils to Apply for Entrance and to Continue Their Secondary Education in the Edward Bok Vocational Technical School.*** **Ed. D., 1949, University of Pennsylvania. 102 p. Penniman Library, University of Pennsylvania, Philadelphia.**

Purpose: To provide criteria for the improvement of the retention of the pupils enrolled in the Edward Bok Vocational Technical School. To ascertain the effectiveness of various influences upon the pupil prior to his entrance into the school and during his training within the school.

Source of Data: Study of the records of pupils admitted to the school—school marks, attendance, interview rating profile charts, standardized and school tests. Comparison, on the basis of information available, between graduates and non-graduates. Relationship of neighborhood influences and traditions on desire to stay in school. By questionnaire, a study of factors contributing to pupil's initial application to attend the school. A study of pupil progress and retention within the school for pupils pursuing the regular program of studies as compared to adjustment program.

Findings and Conclusions: The junior high school advisor exerted the greatest influence other than the home, ranking eighth in 24 identified influences, the counselor twelfth, shop and home room teacher fifteenth. Twelve percent of the pupils entering senior high school reported counselor help in course selection as compared to 3 percent of those selecting the vocational program. The self-appraisal program exercised but little influence as a selection device or indication of probable retention to graduation. There was improvement in pupil interest and success for adjustment pupils as compared to previous records of comparable pupils and with those in regular program.

627. **KOHL, ERNEST O. (Masters).** ***Why Boys Entering the Automechanics Curriculum of the Bok Vocational School Chose that Trade.*** **University of Pennsylvania, c. 1935–47.**

628. **KUSCHE, HOWARD N. (M. S.).** ***Vocational Guidance in High School Industrial Arts in Eastern Wisconsin.*** **Iowa State College, 1936. 64 p.**

A study to discover to what extent the need for vocational guidance is being met in the industrial arts program of the senior high schools and to bring out implications concerning the responsibility of the industrial arts teacher in vocational guidance.

629. **LINDBERG, ROY A.** ***The Use of Guidance in the Industrial Arts Shops.*** **M. A., 1949, University of Minnesota. 94 p. Department of Industrial Education, University of Minnesota, Duluth.**

Purpose: To investigate the extent of guidance, the attitude of instructors and pupils toward it and the techniques employed in connection with industrial arts work.

Source of Data: A documentary and field survey report. Questionnaire to shop teachers in Minnesota and Wisconsin schools.

Findings and Conclusions: As to guidance activity, 85 percent responded *no* and 15 percent *yes*. Great need expressed and instructors favorably disposed.

630. LYDLE, CRAWFORD HENRY. *Developing a Guidance Program for Negro Boys in Senior High School at Muskogee, Oklahoma.* M. S. in Ind. Ed., Kansas State Teachers College, 1946. 85 p.

Gives the conditions and opportunities for Negro youth in the city of Muskogee.

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631. MACDONALD, MANLEY ELROY. *A Study of Changes in the Employment Status of Youth in Detroit.* Ph. D., University of Michigan, 1944. 409 p.

A study of the changes in employment status of youth in Detroit, with implications for social, educational, and vocational guidance.

632. MAHANEY, WILLIAM H. *A Study of Occupational Maladjustment.* M. A., 1951, University of Maryland. 79 p. Library, University of Maryland, College Park.

Purpose: To study occupational maladjustment as it is recognized in the Maryland State Employment Service, to attempt to determine its cause, to investigate its effects on the individual as a job seeker, to ascertain what services are rendered in the assistance of those individuals who are already occupationally maladjusted, to determine what services are rendered by the Maryland State Employment Service in attempting to prevent such conditions, and to evaluate these efforts and suggest changes or additions in the services rendered.

Source of Data: Two analyzes were made, one to indicate the techniques used by the MSES to prevent occupational maladjustment and the other to determine what measures are taken by this agency in regard to persons currently maladjusted and their effectiveness.

Findings and Conclusions: The school and the public employment office have a joint responsibility to society in the area of occupational adjustment. The school is expected to assist the individual in selecting courses which are best fitted to the abilities, needs, and interests of the individual and to provide such courses. The school must also assist the student in setting up a vocational goal and is planning toward that vocational goal. The public employment service should be the agency to bridge the gap between school and job. All school programs involving vocational plans and goals, and placement should be a joint endeavor between the school and the employment service. The employment agency should be the occupational guidance center of the community.

633. MAHONEY, PHILIP HOLMES (M. A.). *A Study of High School Boys' Vocational Choices.* State University of Iowa, 1936. 119 p.

A study of the boy students of the Moline (Illinois) Senior High School and those of the John Deere Junior High School in the same city. Its purpose is two-fold: first, to compile and analyze data pertaining to the vocational choice of junior and senior high school boys; second, to consider the effects, at the senior high school level, of first hand contact with the occupation of choice.

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634. MARSHALL, THOMAS C., JR. (Doctors). *An Interview Study of Adjustment of Recent Graduates with Withdrawals of New York State High Schools in Vocational, Citizenship, and Leisure Time Activities.* Harvard University, 1941.

635. MARTIN, ANSELM GEORGE. *Concepts Employed in Five Current Texts on Vocational Guidance.* M. Ed., 1950, St. Louis University. 83 p. Library, St. Louis University, St. Louis, Missouri.

Purpose: To analyze 5 recent texts on vocational guidance to ascertain and interpret the basic concepts employed and to show their implications for the administration of vocational guidance.

Source of Data: Five books in vocational guidance were evaluated, using a checklist found in the North Central Association Quarterly for October, 1947. A comparison was made of the different concepts in each of the books.

Findings and Conclusions: The definition and aim of vocational guidance as formulated by the National Vocational Guidance Association tend to be accepted. Any program should include full cooperation with home, community, business and industry, and have at its head an experienced teacher with special training in vocational guidance. Full data are required on home, health, social development, academic attendance and progress, mental ability, interest and attitudes. Occupational information should be given in separate courses and in connection with every subject.

636. McCARTHY, MARTHA R. *Occupational Guidance in the Eighth Grade.* M. Ed., St. Louis University, 1945.

A study of methods used in occupational guidance in the eighth grades of St. Louis schools.

637. McCORMICK, JAMES HAROLD. *A Study of the Occupational Plans of the Students of the Small High Schools of Johnson County, Kansas.* M. S. in Ind. Ed., Kansas State Teachers College, 1943. 32 p.

A study of the occupational interests of 187 rural boys.

638. McFERREN, OSCAR E. *A Program of Guidance and Industrial Education for the Public Schools of Great Bend, Kansas.* M. S. in Ind. Ed., Kansas State Teachers College, 1939. 55 p.

An appraisal of the industrial arts and guidance programs in terms of student interests.

639. McGIMPSEY, WILFRED L. *A Proposed Guidance Program for Minneapolis Boys' Vocational High School.* M. A., University of Minnesota, 1942. 56 p.

A study outlining the guidance service needs of a day trade preparatory school and presenting several efficiency factors for such service in a specific school.

640. McKAYE, VERA LETA (M. A.). *A Study of the Work of the National Youth Administration in the Fields of Guidance and Placement and of College Aid.* University of Texas, 1938. 77 p.

A factual study of record data of NYA enrollee, with special reference to their guidance and placement.

641. MEIER, ALTA MATILDA. *Vocational Guidance Programs in Illinois Four-Year High Schools Having an Enrollment of One Hundred or Less.* M. A., University of Colorado, 1943. 87 p.

An investigation of the characteristics of vocational guidance programs in small Illinois high schools and plans in operation in these schools. A program was formulated which provides for occupational information for studying occupational opportunities, tests and records for analyzing the individual and his potentialities, vocational counseling for matching individuals and jobs, placement of individuals in suitable jobs, and follow-up service for evaluating the guidance program.

642. MILLER, JOHN DANIEL. *Areas in Industrial Arts Education Valuable to Employability of Graduates in Edwardsville, Illinois, High School.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 59 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine what areas of industrial arts will contribute most to the employability of the male graduate of Edwardsville, Illinois, High School.

Source of Data: A questionnaire was sent to a sample of graduates employed in the Edwardsville area. The questionnaire contained a list of machines and jobs to be checked to determine the values of instruction received in the industrial arts courses.

Findings and Conclusions: Suggested uses of the findings included: The development of a vocational guidance program for the school; a distributive education program might be warranted; as many of the boys were found on farms, the industrial arts program might present tractor and machine repair courses; areas found most frequently were mechanical drawing, blueprint reading, auto mechanics, machine shop, woodwork, welding, sheet metal, and electricity.

643. NOON, AGNES M. (M.Ed.). *Guiding Vocational Students through the Study of English.* University of Buffalo. 48 p.

A study of the results of a one year program in the teaching of English to industrial high school pupils. The need for diagnostic testing as well as remedial work in English is consideerd.

644. OLMSTED, GLEN NOBLE (Masters). *A Course of Study on Mechanical Drawing for Vocational Guidance.* University of Southern California, 1944.

645. O'TOOLE, CHRISTOPHER (M. S. in Ed.). *The Relationship of Industrial Arts Education to the Future Occupation of 100 Young Men.* Cornell University, 1939. 109 p.

A study of the relationship of industrial arts education to the future occupation of one hundred young men between the ages of seventeen and thirty-two years inclusive in the city of Olean, New York, 1938–39.

646. **PALAZZI, LOUIS J. (M. Ed.).** *Proposals for Industrial Arts and Guidance in the Dunmore, Pennsylvania, Public Schools.* Pennsylvania State College, 1948. 93 p.

Investigates the need for a guidance and an industrial arts program. A curriculum is proposed and specifications and cost of these programs for the seventh to twelfth grades are discussed.

647. **PEPPER, JAMES NELSON.** *A Study of the Vocational Choices of Pupils in Three Michigan High Schools.* M. A., University of Michigan, 1940. 66 p.

A study to determine the reasons for the vocational choices made by pupils in three high schools, based on social, economic, and occupational differences of the students living in the three communities.

648. **POE, BRYCE (M. S.).** *Factors Relating to Industrial Success of Trade School Graduates.* University of Kansas, 1933. 60 p.

Investigates the industrial success of trade school graduates of the classes of 1928–1930, from Lathrop Polytechnic Institute in Kansas City, Missouri. Data are presented showing the relationships between ages, grades, intelligence, personality traits, social-economic background, and industrial success of trade school graduates.

649. **PRICE, DENNIS H. (M.S.).** *A Study of Motivating Factors in Certain Selected Industrial Subjects.* Purdue University, 1935. 73 p.

A study of 138 high school students to determine their reasons for entering the vocational field. The freshman and sophomore groups' reasons were compared with those of the junior and senior groups.

650. **PUMALA, ARDIS E. (Masters).** *A Study of the Vocational Education and Opportunities of the Graduates of the Glencoe, Minnesota, High School for the Years, 1932–39.* University of Minnesota, 1942.

651. **QUINN, BIDD WILLIAM (M. A.).** *Odd Ways of Making a Living and Their Relation to Guidance Programs in Texas High Schools.* University of Texas, 1938. 93 p.

An investigation of 104 unusual occupations to discover vocational possibilities useful in guidance programs. Recommendations for an extended guidance and training program are offered.

652. **RHOADES, GLENN ETTON (M. S.).** Guidance Functions of the *Industrial Arts Teacher in the Small High School.* Oklahoma A & M College, 1942. 136 p.

A discussion of the industrial arts teacher and his place in the guidance program of the small high school of Oklahoma, 1930–1942.

653. **RICHARDS, THOMAS F.** *A Study of the Vocational Interests of Senior High School Boys.* M. S., 1948, The Stout Institute. 54 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To determine the vocational interests of the boys in terms of the school curriculum and to note the particular direction of these vocational preferences.

Source of Data: The method used was a questionnaire developed to secure information on courses taken and preference, shop subject taken and preference, interests, hobbies, and occupational preferences. This study was made of the senior boys in high schools in Winona and Rochester, Minnesota, and La-Crosse, Wisconsin. By personal contact with all of the principals and teachers, the writer oriented them as to the purpose and content of the survey instrument before presenting it to the boys.

Findings and Conclusions: The combined returns amounted to 86.5 per cent of the total number of senior boys in the 3 schools. As a result of the study it was found that important considerations were that: A large percentage of the boys liked to read current events. They desired more try-out courses. An average of 50 percent of the boys in each school had home or school facilities for carrying on hobby work. It was recommended that school curriculum be set up in terms of the pupil's interest, needs, and abilities with emphasis upon the following suggestions: It should be organized so that the teachers can know as much as possible about the individual and his wishes. The school should determine what society wishes the individual to be and set up standards for measuring this attainment. An adequate testing program should be set up for discovering the facts about the individual which will aid in understanding him better, and a guidance program should be organized which will be continuous in its dealings with the student throughout his school life and which can be revised whenever the need arises.

654. RICHARDSON, F. W. (Masters). *Vocational Education and Guidance in the High School of Byers, Texas.* Southern Methodist University, 1931.

655. RILEY, L. GLEN. *Vocational Guidance Needs of Students at the Bryant Junior High Schools.* M. S., University of Utah, 1947. 74 p.

A survey attempting to show the most prevalent needs for a better vocational guidance program in the junior high school only. Reactions recorded by the parents of the boys who attended junior high school proved very helpful in setting up such a program.

656. ROGERS, RALPH C. (Masters). *A Guidance Program for Junior High School through Industrial Arts.* Ohio State University, 1937.

657. RUBERG, SUSAN K. (M. Ed.). *Case Studies of Adolescent Girls of the Helen Fleisher Vocational School.* Temple University, 1935. 331 p.

An analysis of case studies of forty-two poorly adjusted girls taking vocational and commercial work courses for the maladjustments and the extent to which the School was meeting the needs.

658. RUSSELL, DONALD STEPHEN (M. S.). *Vocational Education and Guidance in the Schools of New Zealand.* University of Southern California, 1947. 98 p.

An investigation dealing with the philosophy, objectives, organization, and administration of vocational education in New Zealand with comparisons to practices in the public schools of the United States.

659. SCHNEIDER, KURT ALBERT. *Student Withdrawals From the Adult Vocational Education Program in Richmond, Virginia.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 61 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To discover the reasons for withdrawing as given by persons who had withdrawn from the school over a 5-year period, and the extent to which the school may have been responsible for these withdrawals to learn the implications for the school program directed toward minimizing these losses.

Source of Data: Sources of data were individual withdrawals, by questionnaire, permanent school records, school catalogue, and literature.

Findings and Conclusions: Withdrawals constituted only about one-fifth of the total enrollment for the period. Over one-half of these were for reasons beyond the control of the school. The other reasons given were largely personal and of wide variety. The holding power of the school must be considered to be quite satisfactory under the present methods of administration. A drop-out rate of 20 percent must be normal expectancy in a school of this type.

660. SEGEL, PAUL M. *A School-Sponsored Vocational Guidance Service.* M. A., 1950, Stanford University. 70 p. Library, Stanford University, Stanford, California.

Purpose: To review and evaluate the operations of an adult guidance service.

Source of Data: Data were obtained by observation and inquiry into the operations of the Oakland Vocational Guidance Service as an evening adult class entitled "Vocational Aptitude Testing".

Findings and Conclusions: The continued support of the class is one indication of a need for this kind of guidance service for adults. The class is meeting a definite need. Administration support has been justified. Characteristics of the group seeking guidance service indicate a need for more and better vocational guidance facilities in high schools and colleges.

661. SMITH, GANDY WALTER. *Vocational Guidance as an Aspect of Industrial Arts Teaching in the Negro Schools of Oklahoma.* M. S. in Ind. Ed., Kansas State Teachers College, 1938. 102 p.

The study provides a general overview of the Negro schools of Oklahoma, with special reference to guidance.

662. STONE, JOHN THEODORE (M. A.). *Career Opportunities in the Printing Industry of Baltimore.* University of Maryland, 1948. 49 p.

A consideration of employment opportunities in the printing industry, based on interviews with officials of the trade, for the purpose of furnishing information for vocational guidance.

663. TARWATER, LLOYD H. *A Proposed Plan for a Vocational Guidance Program in the Senior High School.* M. S., 1949, The University of Tennessee. 105 p. Library, University of Tennessee, Knoxville.

Purpose: To present the development of the vocational guidance movement; to apply vocational guidance to a high school program; to show the need; to present the school's part; to give the general organization of such a program; and to study the vocational guidance system in the Knoxville City School System.

Source of Data: Data were secured from textbooks, periodicals, Federal bulletins, and office files of the Department of Guidance and Secondary Education, Knoxville, Tennessee.

Findings and Conclusions: Effective way to conserve youth is to train and use them in the field for which they are best fitted. Chief aim of vocational guidance is to fit the individual for vocational self-guidance. Vocational Guidance Bureau was organized in Boston in 1908 under leadership of Frank Parsons. In 1938 a Division of Occupational Information and Guidance was established in the United States Office of Education and Federal funds made available for study and promotion of vocational guidance. Vocational guidance is to help the individual to choose the proper occupation, prepare for the occupation, to enter and progress in the occupation. Vocational guidance aims to conserve human resources. Vocational guidance should be considered an essential part of a public education program. The principal, under direction of the superintendent, is responsible for vocational guidance. The head counselor, a specialist in vocational guidance, plans and operates the vocational guidance program; and supervises the homeroom teachers and others.

664. TAYLOR, ALLYN C. *Records of Eliminants and Graduates of the Saint Paul Vocational School.* M. A., University of Minnesota, 1948. 77 p.

A comparison of records of eliminants and graduates of the St. Paul Vocational School, with recommendations for lowering the dropout rate and improved service to those retained.

665. VAUGHN, GERTRUDE GWENDOLYN. *A Study of Withdrawn Students From the Industrial High School for Negroes, Birmingham, Alabama.* M. A., University of Michigan, 1938. 86 p.

This study is an investigation of: Why students withdrew from school; what pupils did after they withdrew from school; the family as a major factor in causing the withdrawals of pupils from school; to compare the school to the Birmingham white high schools and the Nation at large; and to give a few tentative suggestions.

666. WAGAMAN, DEAN F. *The Role Of The Industrial Arts Teacher In Proposed Guidance Services For Dodge City High School.* M. S., 1953, Kansas State Teachers College. 59 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a program of guidance for the Dodge City, Kansas, High School.

Source of Data: Data were obtained from a questionnaire, survey, follow-up study, and literature.

Findings and Conclusions: The Dodge City High School should reorganize their guidance program with a qualified counselor placed in charge. A guidance committee should be organized, comprehensive records kept, and placement and follow-up services should be developed.

667. WENZEL, EDWIN B. *Industrial Arts and Guidance.* M. A., University of Minnesota, 1941.

A documentary study of guidance and its relationship to the teaching responsibilities of the industrial arts teacher.

668. WEST, GEORGE HERBERT (Masters). *A Study of New Occupations and Certain Implications for Guidance in the Industrial Arts Program.* Ohio State University, 1940.

669. WILKS, ROLAND LOVETT. *The Function of a Vocational Instructor in a Guidance Program.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 53 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To illustrate how the teacher of vocational industrial education might add to the effectiveness of his program, and, at the same time, increase the scope of vocational guidance.

Source of Data: Data were obtained from books, pamphlets, bulletins, and periodicals.

Findings and Conclusions: The most effective approach in vocational guidance seems to lie in gathering together all the resources and abilities of each individual concerned with public education and to present through this accumulation a concerted effort to utilize the full potentialities of the public schools. Through cooperation of individuals and organizations, the youth of today may be guided into channels best suited to their respective talents.

670. WILLIAMS, DOUGLAS FREEMAN. *The Guidance Needs of South High School Students.* M. S., University of Utah, 1946. 68 p.

A summary of the problems that South High School students recorded as most difficult in the 4 adjustment areas studied: (1) emotional, (2) health, (3) educational, and (4) vocational.

671. WINGO, DONALD COURTNEY. *A Study of the Subject and Occupational Interests of Seniors in Negro High Schools.* M. A., University of Michigan, 1937. 116 p.

Of particular interest is the author's chapter on the implications of certain factors brought out in interpreting the vocational choices of seniors, both for education and social theory.

672. ZINK, CHARLES E. *Predicting Type of Employment From School Records of Machine Shop Students in Sioux City.* M. S., 1953, Iowa State College. 33 p. Library, Iowa State College, Ames.

Purpose: To evaluate the machine shop program in the Sioux City Public Schools in terms of post-graduation occupation.

Source of Data: Data were secured from the records of 153 machine shop graduates employed as machinists, in related trades, and in non-related occupations. Triserial correlation techniques were used.

Findings and Conclusions: Almost 50 per cent of the graduates were working as machinists. The only variable found significant was the grade received in machine shop classes.

Counseling

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673. BARNETTE, W. LESLIE, *Jr.*, *Occupational Aptitude Patterns of Counseled Veterans.* Ph. D., 1949, New York University. 385 p. New York University Library, New York and Library of Congress.

Purpose: To ascertain the effectiveness of test pattern data for the vocational and educational guidance of 890 World War II veterans counseled at the Vocational Service Center Branch, YMCA, New York City, and the occupational differences between disabled and non-disabled veterans as well as with their status two years after their advisement and guidance.

Source of data: A pilot study preceded the actual study itself. A questionnaire was used to gather the information. A relationship is set up to indicate occupational patterns representing seven different occupational fields. Questionnaires were analyzed in terms of these categories: "Never began," "drops," "continuous," "completed."

Findings and Conclusions: In most respects, the non-disabled group was similar to the disabled group. The latter group provided several signs of greater occupational training stability. The largest group contains clients who began and are still pursuing the approved training. A high percentage of all respondents indicated satisfaction with current training status. Counselor prognoses for the "never begans" and the "drops" were far more accurate than chance values. The patterns based on unrelated occupational areas have been shown to be distinct when inter-occupational comparisons are made. Those based on related occupational fields show moderate, but not high, similarity. The concept of the occupational aptitude pattern is thus justified in terms of such over-all similarity-dissimilarity comparisons.

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674. CASNER, DANIEL. *Certain Factors Associated With Success and Failure in Personal Adjustment Counseling.* Ph. D., 1950, New York University. 208 p. Library, New York University, New York and Library of Congress.

Purpose: To search for factors related to the outcome of personal adjustment counseling with veterans.

Source of Data: Total population of 159 consecutive referrals studied in relation to degree of improvement.

Findings and Conclusions: Lack of generally accepted definition of "success" in psychotherapeutic counseling need not stand in way of needed research. Competent judges can reach considerable agreement in their evaluation of counseling outcomes. Natural setting of an investigation can determine materials to be used. The counseling situation resembles a learning situation.

675. DARLEY, LLOYD P. *A Study of Programing Industrial Education Students at Richmond Union High School.* M. A., 1954, San Francisco State College. 24 p. Library, San Francisco State College, San Francisco, California.

Purpose: To identify the factors relating to the retention of trade and industrial education classes in the industrial education program at Richmond Union High School.

Source of Data: Data were obtained from students by means of a questionnaire.

Findings and Conclusions: There is need for more careful counseling at the junior high school level. Shop course titles should be clarified. A need for an additional auto repair shop exists.

676. JOHNSON, MILO PERRY (M. A. in Ed.). *The Trade and Industrial Education of Negroes in the Los Angeles Area.* University of California at Los Angeles, 1945. 86 p.

This study concerns training opportunities for Negroes in the Los Angeles area and employment of the Negro worker in trade and industry in the postwar world. The occupational adjustment of the Negro and the need for special training and counselors are treated.

677. McMANIS, KENNETH O. *The Process of Occupational Orientation for Individual Counselees in Guidance Programs of Junior and Senior Public High Schools of Michigan.* M. A., 1950, University of Michigan. 98 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To determine how well the guidance programs of the junior and senior public schools of Michigan are carrying out the process of occupational orientation for individual counselees.

Source of Data: A survey of recent literature was made to determine the status of the problem. In addition a questionnaire was mailed to all junior and senior high schools in Michigan.

Findings and Conclusions: A comparative account was given of the personnel available for counseling both in the junior and senior high schools. The guidance services: For personal inventory, 9 out of 10 schools had a cumulative record for each pupil; for informational service, it was found that educational is used to practically the same degree in both junior and senior high schools while vocational information is used by 75 per cent of the senior high schools as compared to 62 per cent of the junior high schools; the counseling service—it is significant to note that uncertainty exists in the schools concerning counseling service, as indicated by the high degree of "questionable" and "no" answers; vocational placement lagged behind educational placement, being 42 per cent as over against 79 per cent for the latter; educational and occupational follow-up is used in only 11 per cent of the junior high schools and 28 per cent of the senior high schools.

678. NOBLE, ROBERT L. *Instruction and Guidance Duties of Vocational Shop Instructors.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 41 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To analyze a segment of the instructor's job which includes recording data on qualifications of day trade teachers, and pertinent information related to instruction and guidance.

Source of Data: Study and review of texts and references.

Findings and Conclusions: The vocational shop instructor has a definite obligation in counseling and guiding students. This report may be combined with other related duties of vocational shop instructors to provide a handbook, and may aid in the standardization of teaching and guidance procedures.

679. PRUSKI, JOHN. *A Study of Vocational Counseling Results Based on the Case Study of Three Hundred Male Veterans at the Ohio State University.* M. A., 1950, Ohio State University. 68 p. Education Library, Ohio State University, Columbus.

Purpose: To determine the results achieved through vocational counseling of 300 veterans enrolled at the Ohio State University and to determine if students and college personnel desired such service.

Source of Data: Data were secured from records obtained from the Occupational Opportunities Service of the institution. Case studies were selected at random from students whose names began with K or S.

Findings and Conclusions: Data revealed that 83 percent of the group sought counsel on a voluntary basis and that 43 percent had well thought out plans. Findings further revealed that approximately 34 percent of the group studied were of college calibre but apparently were pursuing curricula unsuited to their interests and potentialities. Vocational counseling is needed at the college level and possibly at other levels of training.

680. **TAYLOR, LOUIE SHEETS.** *The Professional Status of the Industrial Arts Men Teachers in the California Separate Junior High Schools.* M. A., Claremont Colleges, 1939. 49 p.

The results of this study might be of value in student counseling in an industrial-arts teacher-training institution.

681. **WELCH, NORMA.** *Vocational Interests of Junior High School Girls in Relation to Counseling.* M. A., University of Michigan, 1934. 54 p.

An attempt was made to determine the extent to which junior high school girls were sufficiently familiar with occupations to the end that they might make effective curriculum choices.

682. **WIESER, WILLIAM W.** *An Analysis of Tests Used in the Secondary School Guidance Program.* M. S., 1949, The Stout Institute. 115 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To provide information for the guidance counselor as to the types of tests available, the sources of these tests, and other available information.

Source of Data: A normative-survey method of scientific research was used. A survey of 100 secondary schools was made to determine the tests being used at these schools. This was presented in table form.

Findings and Conclusions: The testing program is divided into the following phases: intelligence testing, interest testing, personality testing, achievement testing, and aptitude testing. There are a great number of standardized tests available within each of these phases. In light of the facts presented by this study, it is recommended that: (1) each secondary school have a testing department; (2) every student should receive a battery of tests upon entrance, and these results should be kept in a confidential file; (3) no individual shall be informed of the test results unless a complete explanation of the results is included; and (4) the student may ask for a re-test; however, care must be taken so that a different form of test is used.

Follow-Up

683. **AARONIAN, ANNETTE A.** (Masters). *The Selection and Follow-up of Workers in Industry as an Educational Problem.* Brown University, 1943.

684. **ANDERSON, CHESTER ROBERT.** *Occupational Progress Made by Industrial Arts Students in Lincoln High School, Kansas City, Missouri.* M. S., 1949, Iowa State College. 38 p. Library, Iowa State College, Ames.

Purpose: To ascertain the occupational progress made by industrial arts students of Lincoln High School, Kansas City, Mo.

Source of Data: A check list was used to ascertain the occupational progress made by graduates of Lincoln High School, Kansas City, Mo., 1943–44 to 1946–47.

Findings and Conclusions: The graduates did not have too much trouble securing jobs, and they were making a fair salary.

685. **ANDERSON, JEAN ANDREW** (M. S.). *A Suggested Plan for Follow-Up for the Industrial Education Division of a Teachers College.* The Stout Institute, 1948. 137 p.

A survey of sixty colleges and universities in twenty-nine states to determine present practice in follow-up programs in the industrial education divisions.

686. **ANDREWS, WILLIAM C.** *Factors Determining Vocational Choices of Secondary School Students.* M. A., Claremont Graduate School, 1931. 167 p.

A study of a follow-up program of 1,700 students starting at the junior high school level and continuing for 3 years, with suggestions for setting up a vocational guidance program.

687. **BARTON, MARIE TAYLOR.** *A Trade Preparatory Program in Commercial Art for Nashville, Tennessee.* M. S., 1955, University of Tennessee. 110 p. Library, University of Tennessee, Knoxville.

Purpose: To follow-up the graduates of the trade preparatory class in commercial art at the Hume-Fogg Technical and Vocational High School, Nashville.

Source of Data: Data were obtained through a questionnaire and personal interviews.

Findings and Conclusions: At the time of the study, fifty-eight percent of the graduates were employed in commercial art positions or otherwise using their art training. Twenty-three percent were housewives. Eight percent had entered another occupation and a number were continuing their training. Most were employed in the field of layout with display and lettering second.

688. **BAUER, RONALD R.** *A Follow-up of the Industrial Education Graduates Receiving the Bachelor of Science Degree from the Stout Institute During the Years 1946–1949.* M. S., 1950, The Stout Institute. 103 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To gather information and facts regarding the guidance services and the curriculum offered by the college.

Source of Data: The normative-survey method of scientific research was used. The questionnaire was the survey instrument.

Findings and Conclusions: 85.5 percent of respondents were employed in the teaching profession. Most frequently the general unit shop type of instruction was maintained. The majority of industrial education teachers also assumed responsibility for one or more extracurricular activities. The most common problem, as indicated by 78 percent of the teachers, was the organization of instructional material. Information was compiled indicating the areas of instruction that the teachers thought has been under-emphasized in their training. From 94.7 to 75.7 percent of the teachers considered that the guidance services listed were necessary for students now in school. A very large majority of the teachers desired that the college offer some type of service for graduates. 94.8 percent showed a desire for a replacement bureau and 97 percent wished to have printed material developed by the college made available. The writer offers two recommendations: That this study should be reviewed by the faculty curriculum committee; and a well-defined and complete guidance program under a guidance director be established to serve the students of Stout Institute.

689. **BERGMAN, EDWIN C.** *A Follow-up of the Graduates of Timken Vocational High School of Canton, Ohio.* M. S., 1950, The Stout Institute. 86 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To make evaluation of the educational program at Timken Vocational High School in terms of a statistical compilation of employment data, experiences, and opinions of students after their graduation from this school.

Source of Data: A normative-survey research procedure was used. Questionnaires were sent out to a total of 377 graduates. Questionnaires were returned by 266, or 70.15 percent of the graduates.

Findings and Conclusions: The results of this survey showed: Placement opportunities, factors involving the choice of vocational training, advanced training, deficiencies in the training program, jobs available in the industrial trades, employers, present location, and general comments. Recommendations indicated a need for: Coordination, guidance, advisory committees, placement bureau, and type of follow-up studies to be made in the future.

690. **BLUM, JOSEPH STANLEY (M. S.).** *A Follow-up Investigation of Smith-Hughes Graduates of the Oakland Public Schools for the Year 1928.* University of Southern California, 1936. 102 p.

A study of the value of vocational guidance and training in terms of placement of the student in the occupational field of his choice. The study is limited to Oakland, California.

691. **BREEDEN, CHARLES LOUIS** (M. A.) *Follow-Up Study of Graduates of Special Industrial Arts Course From 1925 to 1940 (at Indiana State).* Indiana State Teachers College, 1942. 104 p.

A comparative study of the reactions of students who graduated from Indiana State regarding their training at Indiana State and their suggestions for improving the program, for the purpose of evaluating the industrial arts course.

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692. **BRIGHAM, ELDEN L.** *The Relative Effectiveness of Incidental Guidance and a Program of Intensified Education and Vocational Guidance on the Adjustment and Vocational Success of a Class of Flint, Michigan High School Students Five Years After the Graduation of the Class.* Ph. D., 1950, the University of Michigan. 49 p. General Library, University of Michigan, Ann Arbor.

Purpose: To determine what differences, if any, were to be found in the educational and vocational adjustment and in the vocational success of the two halves of the same high school class when one-half is given only general or incidental guidance and the other half is given a carefully planned and administered program of intensified guidance.

Source of Data: The class was canvassed by means of questionnaires. Sixty percent or 145 experimental and 133 of control group responded. An interview was used with questionnaire. Both utilized rating scales.

Findings and Conclusions: Intensive guidance was influential in bringing about the following results: A closer relationship between vocation and measured interests on the part of the experimental men and women, more stable curricula and a higher percentage of graduation from high school of the experimental subjects, plans to attain and the actual attainment by experimental subjects both of advanced training at the college, or university level, and of higher occupational levels. While the obtained differences are quite consistently in favor of the experimental groups, in the opinion of the author himself, the case in general for the relative effectiveness of intensive over incidental guidance is not proved.

693. **BROWN, GEORGE W. (Masters).** ***A Follow-up Study of the Graduates of Benson Polytechnic School (1925–1929).*** **Oregon State College, 1932.**

694. **BROWN, M. LETITIA (Masters).** ***Follow-up Study of Students of a Vocational School.*** **Howard College, 1933. 90 p.**

695. **BUELL, CLAYTON E. (Masters).** ***A Follow-up Study of Graduates of the Bok Vocational School.*** **University of Pennsylvania, c. 1935–47.**

696. **BUTLER, J. A. (M. S.).** ***A Survey of the Graduates of Technical High School, Dallas, Texas From 1938–1945 to Determine the Effectiveness of the Training Program.*** **North Texas State College, 1947. 43 p.**

A ten year follow-up study of technical high school graduates of value in the development of a related subjects curriculum.

697. **COAKLEY, ELIZABETH K.** ***The Placement and Follow-Up of Boys in Vocational Training Programs of the Agencies in St. Louis.*** **M. A., St. Louis University, 1945. 74 p.**

A study of agencies using follow-up methods after placement of their applicants with a scale developed as the basis for planning, administering, and evaluating the service.

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698. **CUONY, EDWARD RICHARD.** ***An Evaluation of Teaching Job Finding and Job Orientation.*** **Ph. D., 1953, New York University. 186 p. Library, New York University, New York.**

Purpose: To evaluate the effectiveness of a course in job finding and job orientation.

Source of Data: One year after graduation from high school a follow-up study was made of the experimental group and the equated control group. The data obtained from the graduates were used to compare the groups with reference to job satisfaction, average weekly earnings, and the number of weeks employed.

Findings and Conclusions: The course in job finding and job orientation enabled the students in the experimental group to be better satisfied with their jobs. This course enabled students in the experimental group to earn more during the first year after graduation. The addition to the guidance program of the course was justified by the results.

699. **DAVIS, GEORGE W. (M. S.).** ***A Study of the Graduates of the Division of Trades and Industries of Hampton Institute from 1920 through 1939: Their Occupations, Community Interests, and Their Recommendations for the Division.*** **Pennsylvania State College, 1945. 92 p.**

A follow-up study of the graduates of the Division of Trade and Industries of Hampton Institute from 1920 through 1939 in an effort to evaluate the effectiveness of the Institute's program.

700. **DeSELLE, CARROLL WINDSOR (M. S.).** ***A Follow-Up Study of the Graduates of San Jose Technical High School.*** **Oregon State College, 1940.**

A follow-up study of graduates over a period of sixteen years in eleven trade divisions. It suggests industrial arts courses in the regular academic high school for those who cannot choose or profit by trade training courses.

701. **DOTY, VERNON ELSTEN.** ***Occupational Distribution of the 1948 and 1949 Graduates, Abraham Lincoln High School, Council Bluffs, Iowa.*** **M. S., 1952, Iowa State College. 85 p. Library, Iowa State College, Ames.**

Purpose: To follow-up and learn the distribution of a group of graduates according to occupation following graduation.

Source of Data: Data were obtained through questionnaires from the 1948 and 1949 graduates.

Findings and Conclusions: Of the male graduates studied, 21.5 per cent were in college and 43 per cent in military service. Leading occupations of girls were: housewife, office worker, and college student. A total of 42 types of activities were reported.

702. **FLANNIGAN, CLARE FRANCES** (M. A.). *A Study of the Occupational Adjustments of a Selected Group of Colored High School Graduates.* The Catholic University of America, 1932. 54 p.

A descriptive analysis of the graduates of Dunbar High School three years after graduation; only those who went into industry were considered. Recommendations are made for vocational-adjustment guidance of Negroes in the secondary schools.

703. **FOSTER, OLIVE VIRGINIA** (M. S.). *Occupational Study of Graduates of Gerstmeyer Technical High School 1925–1930, Inclusive.* Indiana University, 1939. 122 p.

A "follow-up" study, with conclusions made regarding the guidance facilities of the school.

704. **FURLONG, JOHN.** *A Study of the Techniques Used in Selected Follow-up Studies with Special Implications for Vocational School Graduates.* M. A., 1955, University of Minnesota. 115 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide information that will allow for better understanding of the needs, techniques, and functions of follow-up studies with special implications for vocational school educational programs.

Source of Data: Data were obtained from the Department of Industrial Education, books, bulletins, and unpublished materials available in the University of Minnesota Library.

Findings and Conclusions: The attainment of the goal of providing an adequate educational program requires the availability of factual information. The follow-up study is a means of finding this information. Minnesota needs a valid, reliable, and objective follow-up study of its vocational school students.

705. **GAUERKE, RUDOLF E.** *A Follow-up Study of Graduates and Drop-Outs of Marinette High School From 1945–1949.* M. S., 1950, The Stout Institute. 53 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To determine whether the present curriculum was meeting the needs of the students of the Marinette, Wis., High School.

Source of Data: Literature on follow-up and follow-up studies was reviewed and a questionnaire was constructed. The questionnaire was sent to the former students. The results were tabulated, interpreted, and summarized.

Findings and Conclusions: The findings revealed many weaknesses in educational and vocational guidance. The graduates indicated a desire for guidance and counseling and the advisability of revising the curriculum. The writer recommended a periodic follow-up, curriculum revision, employment cooperation, a well-rounded, continuous guidance program for all students, and a study of former student problems and student recommendations.

706. **GECAN, CHARLES VINCENT.** *A Follow-up Study of the Graduates of a Large City High School for the Five-Year Period, 1936–1940.* M. A., University of Colorado, 1941. 144 p.

An investigation to discover how well the school meets the vocational needs of its pupils and to procure a cross sectional view of the community.

707. **GONSER, MARTIN EDSEL.** *A Follow-Up Study of Graduates with Majors in Industrial Education from 1935–1949.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 40 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To obtain information on the location and status of the graduates, to measure to some degree the effectiveness of the training those individuals received, and to secure their suggestions for the improvement of the program of industrial education at Kansas State Teachers College.

Source of Data: Questionnaires sent to graduates.

Findings and Conclusions: Eighty-three percent of the graduates held teaching or administrative positions in schools, and 69 percent taught in junior and senior high schools. Average salaries for bachelor's degree was $3145 and for the master's degree $3413. Ninety-one percent of the graduates were married, 75 percent of whom had children. Seventy-five percent were employed in the State of Kansas. Courses were very helpful and a majority expressed regret that they were unable to take certain courses which they believed would have been helpful. Some criticism of certain education courses as "not of a practical nature" and "too much repetition."

708. GYGER, BERNARD RAY. *Employment Status of Day Trade Preparatory Graduates (Omaha Technical High School).* M. Ed., 1950, Colorado Agricultural and Mechanical College. 103 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To make a follow-up study of graduates of the Omaha Technical High School; 1946–1947; 1947–1948.

Source of Data: Sources of data were questionnaires, records, interviews, review of literature in field. The study is based on a follow-up study of 160 of the 167 day trade preparatory graduates of Omaha Technical High School, Omaha, Nebraska, for the school years 1946–1947 and 1947–1948. Courses included were auto mechanics, drafting, electricity, food service, machine shop, patternmaking and foundry, printing, sheet metal, and woodworking. The employment status, number entering the field in which they were trained, tenure in field for which they were trained, and reasons why some did not enter their chosen field for each graduate. Findings were compared with other studies in the field were ascertained throughout the country.

Findings and Conclusions: Sixty-three and eight tenths percent of the 160 graduates were employed in the trade in which they were trained. Reasons why graduates did not enter field for which they were trained were: Enrolled in school; entered the Armed Forces; did not try to get job in trade; quit to take other jobs. A thorough examination of other studies in the field was made and percent of those entering the trade for which they were trained was compared with the findings. The bibliography of 60 references is most complete. Some new information regarding tenure of day trade graduates in the field for which they were trained was developed.

709. HACK, M. F. (M. S.). *A Follow-Up Study of the Merrill High School Graduates of Vocational Preparatory Courses—A Survey to Determine the Relation of Their Vocational Preparation in High School to Their Subsequent Employment.* The Stout Institute, 1942. 47 p.

School records and questionnaire surveys of 128 graduates in industrial arts, home economics, and commercial courses, from 1935 to 1939, were analyzed to determine how well the school prepared its graduates vocationally.

710. HARTMAN, WILLIAM I. *A Suggested Graduate Follow-Up System for Trade and Industrial Education.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 67 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To formulate a plan for following-up trade and industrial school graduates in the State of Oklahoma.

Source of Data: Questionnaires were used to secure information concerning programs in existence and need for a follow-up system. Literature on the subject was reviewed.

Findings and Conclusions: Material on actual follow-up systems is quite limited. Research on a regional or national scale should be undertaken. There is definite need of follow-up at present in the local trade and industrial programs. Trade instructors and coordinators should be aware of the value of follow-up studies.

711. HILL, LESTER VANCO. *A Follow-Up Study of the Graduates of Three Negro Trade Training Institutions of Virginia for the Period 1927–37.* M. S. in Ind. Ed., University of Michigan, 1938. 113 p.

A study of trade school graduates to determine what changes should be made in school curricula so that trade training may be made more effective.

712. HILLIARD, ALLEN FRANKLIN. *An Occupational Follow-up of the Graduates of 1946 of Benton Harbor High School, Benton Harbor, Michigan.* M. A., 1951, University of Michigan. 55 p. Library, University of Michigan, Ann Arbor.

Purpose: To ascertain the occupational status of the class of 1946 of Benton Harbor High School, Benton Harbor, Michigan.

Source of Data: Data were secured by a questionnaire sent to 263 members of the graduating class of 1946 of Benton Harbor High School.

Findings and Conclusions: Nearly half of the respondents took some formal training beyond high school. Most of the employed graduates decided on their present type of work either in or since senior high school. A large percentage of the employed graduates credited themselves with making the decision to enter their present type of work. Eighty-three percent of the employed graduates were working in the local area. Half of the employed group would not change their jobs, even if they could choose to do it. Over 90 percent of the employed graduates felt that the high school was helpful in preparing them for work.

713. HILTY, CHARLES E. (M. S.). *A Study of the Graduates of the Vocational Department of the Williamsport High School and the Williamsport Technical Institute from 1937 through 1945.* Pennsylvania State College, 1948. 38 p.

A follow-up of graduates of the Williamsport Technical Institute from 1937 to 1945 to determine their present occupations and the extent they have followed the vocations in which they were trained. The effectiveness of the vocational education program is evaluated.

714. HORVATH, J. E. (Masters). *A Study to Discover the Extent to which Graduates from the Auto Mechanics Curriculum at the Philadelphia Northeast High School Have Secured Employment in Some Phase of the Automotive Industry.* University of Pennsylvania, c. 1935–47.

715. KELEHAN, IRMINA. *Ten-Year Follow-Up Study of the Graduates of St. Joseph's Academy, St. Paul, Minnesota.* M. A., St. Louis University, 1946. 207 p.

A study of graduates of a girls' academy which aims to show the practical value of courses in relation to life adjustment, with some emphasis on occupational adjustment.

716. KENNEDY, HELEN M. *An investigation into the Adult Adjustment of Former Pupils of a St. Louis Special School Who Withdrew During the Years 1930 Through 1940.* M. A., St. Louis University, 1945. 144 p.

A study of former pupils of special schools in St. Louis and their adjustment to adult life.

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717. LEONARD, REGIS L. *Experiences of Certain Vocational High School Graduates in Occupational Affiliation.* Ph. D., 1950, University of Pittsburgh. 199 p. Library, University of Pittsburgh, Pittsburgh, Pa.

Purpose: To discover the occupational affiliation of a graduating class of vocational high school students who had completed at least 2 years of school trade training.

Source of Data: The information secured by means of interviews.

Findings and Conclusions: One hundred twenty-three of the 133 graduates of Pittsburgh vocational high schools were located. Only those completing at least 2 years of trade training in bricklaying, electricity, machine shop, plumbing, printing or wood shop were included in the original number selected. Less than one-half of the graduates obtained employment in the field for which they were trained. Many of the remainder took jobs in non-related fields or were unable to secure employment. The author of the study recommends a more careful downward and upward guidance to secure better placement. A more positive approach for placement and follow-up, by the schools, is needed to replace the trial and error basis so commonly found.

718. LERNER, MAX J. *Survey of Graduates and Dropouts of Canal Winchester High School — 1937–1948.* M. A., 1948, Ohio State University. 54 p. Education Library, Ohio State University, Columbus.

Purpose: To determine the vocational activities of graduates; to test the functioning power of the present curriculum and to determine needed changes.

Source of Data: A survey of the graduates for the past 10 years was conducted by means of a questionnaire. A similar questionnaire was administered to the graduating class of 1948.

Findings and Conclusions: English, ability to get along with people and the habit of getting things done were considered to be of primary importance; more than 11 percent of the students who entered the ninth grade dropped out before graduation, more than half of the graduates felt the need for specialized training. Recommendations included a more effective guidance service, better student records, adult education as part of the total program and the development of self-discipline.

719. LONDON, H. H., *and others. Day-Trade Preparatory Graduates, Central Region, Class of 1948: A Follow-Up Study.* 1953, 48 p. Department of Industrial Education, University of Missouri, Columbia.

Purpose: To find out what day-trade preparatory students had done during the five years since graduation; to ascertain the chief difficulties they encounter; to secure constructive criticisms of day-trade programs; and to formulate suggestions for their improvement.

Source of Data: An information form, together with an accompanying letter, was prepared and sent in bulk to state supervisors, who in turn sent them to principals of schools in eleven north central states having trade preparatory programs. These were mailed by the principals to all day-trade graduates of 1948 in these eleven states. A second form, which included an employee rating scale, was developed and sent to state supervisors, who in turn sent a copy to the last employer of each graduate. Usable forms were returned by 1,942, or roughly 22 per cent of the 8,809 graduates, and by 1,163, or approximately 54 per cent of the employers. Copies of the forms are found in the report.

Findings and Conclusions: Trade preparatory training was being offered in only 23 skilled trades. The number of graduates in the region was wholly inadequate to meet the demand. Of those graduates responding, five years after graduation, 42.5 per cent were employed in the trade for which they were trained, 12.6 per cent were employed in related trades, and 44.9 per cent were employed in unrelated occupations. Those employed in related trades received higher initial wages and also higher wages five years later than either of the other groups. The six trades in which most students were trained were in order of rank: machine shop, auto mechanics, electrical work, drafting, building trades, and printing. Work experience was the most important factor influencing youth to enroll in a trade preparatory program; the influence of the counselor, as reported, was practically negligible. Over 73 per cent of the graduates were well pleased with their occupation, but there was little agreement among them as to what should be emphasized in trade training. Practical experience and additional technical knowledge was the greatest need of the graduates. Most employers rated the graduates as average or above on all eight items in the rating scale. Weaknesses most often pointed out by employers were, "slow worker", "lack of confidence", "lack of experience", and "lack of interest". Trade preparatory programs need to be expanded, vocational guidance services need improving, and the schools should add cooperation and adult programs.

720. LYNCH, MELVIN A. (Masters). ***A Follow-Up Study of Vocational Students.*** **Massachusetts State College, 1938.**

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721. MADDOX, MARION ERROL. ***Educational Needs Of Youth And Adults Of Moberly, Missouri.*** **Ed. D., 1951, University of Missouri. 152 p. Library, University of Missouri, Columbia.***

Purpose: To ascertain entry job opportunities and the educational needs and interests of youth and adults of Moberly; to evaluate the present educational program of Moberly Junior College; and to suggest improvements in the present education program.

Source of Data: Data were secured from an entry job survey of the city of Moberly; follow-up study of students of 1946–47 school year; survey of students currently enrolled; opinions of adults of the community; records of Moberly Public Schools; and State Department records. Percentage and rank technique was used to handle the data.

Findings and Conclusions: The Moberly Junior College seemed to be performing its function of college preparation and pre-professional preparation satisfactorily. The course offerings for students who will work at service, semiskilled, distributive, farm, machine operator, and technical jobs were not adequate. The adult education program in general and vocational education needed to be expanded. The Moberly Junior College needed to develop better guidance services. The addition of certain courses in general, technical, and vocational education was recommended.

722. MANKEN, GERALD IVAN. ***An Occupational Follow-up of the Graduates of Willshire High School 1932–1951.*** **M. Ed., 1953, The Ohio State University. 55 p. Library, The Ohio State University, Columbus.**

Purpose: To ascertain the studies and activities participated in while in school that now seem the most valuable to the graduates of Willshire High School for the period 1932–1951.

Source of Data: Data were obtained from a questionnaire sent to graduates from 1932–1951.

Findings and Conclusions: Many implications were gathered from the graduates' responses and recommendations were made for the improvement of the total educational program and particularly the industrial arts area.

723. MEYER, EDWIN DAVID (M. S.). ***A Follow-Up Study of Industrial Arts Graduates of Oregon State College Since 1915.*** **Oregon State College, 1940. 89 p.**

A study of the graduates of the college from 1915 to 1940 including such items as their work, their earnings, and their satisfaction with the courses offered at Oregon State in an effort to improve the present curricula.

724. MILLER, ELIZABETH RILEY (Masters). *A Follow-Up Study of 50 Former Waialee Training School Boys.* University of Hawaii, 1938.

725. MILLER, GRAHAM R. (M. S.). *A Plan of Implementation for the Denver Occupational Adjustment Service.* Colorado Agricultural & Mechanical College, 1941. 452 p.

A study of the working relationship between the high schools and Denver employees. Specific needs and difficulties are investigated, and the effectiveness of the new program is appraised.

726. MILLER, W. R. *and* SPELMAN, D. G. *A Follow-Up Study of Graduates of the University of Missouri With Majors in Industrial Education.* 1955, 30 p. Department of Industrial Education, University of Missouri, Columbia, Missouri.

Purpose: To learn where the industrial education graduates of the University of Missouri come from, where they go, what types of work they enter, their annual earnings, what additional education they have had, and to obtain their criticisms of the courses they took at the University and their suggestions for improving the program.

Source of Data: Data were obtained from a questionnaire sent to graduates of the University of Missouri who obtained majors in industrial education between 1920 and 1954.

Findings and Conclusions: Approximately 50 per cent of the graduates were Missourians; the remainder came from many different states. Fifty per cent of the graduates were residing in Missouri while the remaining 50 per cent were scattered over 34 states and territories. Approximately 80 per cent have remained in education, about 25 per cent being in college work. The more education they have had, the more likely they are to remain in educational work. The main reason for leaving the teaching field was insufficient salaries, with lack of opportunity for advancement a close second. The average salary for Doctor's degree graduates was $6,594.00; for Master's degree graduates in education it was $4,500.00; and for Master's degree graduates employed in noneducational work is was $7,250.00. The average salary for Bachelor's degree graduates in education was $4,016.00, while for those employed in non-educational work it was $5,200.00. Approximately half of the graduates had had additional formal education, chiefly in industrial education, school administration, and guidance. In the opinion of the graduates, the following areas of training were weakest: public speaking, electricity, personnel and public relations, extra curricular activities, and shop skills. The most frequently offered suggestions for departmental improvement were: offer advanced shop courses for graduate students, more realistic practice teaching, and more emphasis on shop and drawing skills for undergraduates.

727. MORRISON, RUSSELL T. *A Follow-Up Study of the Graduates of Five Seventh-Day Adventists Secondary Schools.* M. S., 1952, Stout State College. 57 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To make an evaluation of the educational program of the five Seventh-Day Adventist secondary schools of Colorado, Kansas, Missouri, Nebraska, and Wyoming in terms of statistical compilation of employment data, experiences, and opinions of students after their graduation from these schools.

Source of Data: Data were obtained from questionnaires sent to 138 graduates.

Findings and Conclusions: It was recommended that competent guidance services be set up in each academy; that additional courses of a vocational nature be incorporated into the curriculum; that students be permitted to take a general course which would allow them to graduate with more shop classes than is permitted under the present regulations; and, that the Union Conference Educational Departments maintain a continuous survey of the occupational opportunities.

728. MUNDY, PAUL WILLIAM. *Vocational Opportunities in Washington, D. C., for Negro Boys Who Do Not Complete High School.* M. A., Catholic University, 1948. 83 p.

The study explores the vocational or job opportunities for those Washington, D. C., Negro boys, between the ages of 15 and 18, who do not complete high school. The problem is viewed in its economic, educational, legal, political, and ethical setting.

729. MURPHREE, WILLIAM N. *A Study of Mullens High School Boys: A Follow-up Study of Boy Graduates and Drop-outs During the Period 1943–1948.* M. A., 1949, Ohio State University. 89 p. Education Library, Ohio State University, Columbus.

Purpose: To determine that type of program and form of organization to be used when organizing a program of industrial arts for a small high school.

Source of Data: Relevant data concerning content and form of organization were secured by means of a questionnaire and personal interviews with graduates and drop-outs during the period 1943–1948.

Findings and Conclusions: The largest number of drop-outs occurred in the ninth grade with the greatest number leaving to enter employment. Boys were employed in 44 occupations with a majority engaged in railroading and mining. Four-fifths of both groups had held more than one job with one-tenth of the 2 groups in work for which their training could be considered preparation. Graduates' wages were found to be a little higher than drop-outs. Three-fourths of both groups like their present employment. Data secured show former students were interested in 19 units of industrial arts and that a general shop will best serve the needs of the students in a small high school.

730. MYLER, HAROLD F. *A Follow-Up Study of Vocational Graduates and Drop-outs of Dearborn High School, Dearborn, Michigan.* M. A., University of Michigan, 1940. 62 p.

An analysis of the reactions of graduates and drop-outs of the vocational department for the purpose of improvement of the curriculum.

731. NEFF, HERMAN ARTHUR (M. Ed.). *A Survey of the Dallas Technical High School Graduates from January 1930 through January 1938.* University of Texas, 1947. 102 p.

A follow-up of some two thousand students graduating over an eight-year period, as to their further schooling, utilization of their technical training, their employment experiences, and their suggestions as to curriculum revisions.

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732. NELSON, A. FRANK. *Follow-Up Study of Industrial Arts Graduates of North Texas State College.* Ed. D., 1955, University of Missouri. 177 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain the professional status and location of the industrial arts graduates of North Texas State College, to obtain some measure of the effectiveness of the training they received, to secure their suggestions for the improvement of the program of industrial arts at the college, and to furnish data upon which authorities might justify changes in the present program.

Source of Data: Information was obtained by the use of information forms returned by 67.5 per cent of the 833 graduates whose addresses were obtained from the official records at North Texas State College.

Findings and Conclusions: A majority of all respondents were in the teaching profession. Almost 37 per cent had completed an advanced degree. The most frequently mentioned educational activity reported was teaching of industrial arts followed by administration work. The largest per cent of respondents in industrial positions were employed in some phase of the aircraft industry. The industrial arts course considered by the respondents to be of most value to them was mechanical drawing. Elementary electricity was selected by more respondents than any other as being a course that would have aided them in their work. Instruction in electricity, automobile mechanics, and upholstering and wood finishing should be made available to all industrial arts majors whenever possible. A more effective program in guidance and counseling should be made available. Consideration should be given to providing a curricula of terminal education for those planning to enter industrial occupations. Students should be encouraged to take work in the fields of art, guidance, business administration, speech, and physics.

733. NEVANS, ANNA ADELAIDE. *A Follow-Up Study of the Vocational Adjustment of Saint Joseph High School Graduates.* M. Ed., 1950, Saint Louis University. 94 p. Library, Saint Louis University, Saint Louis, Missouri.

Purpose: To ascertain the vocational adjustment of St. Joseph High School graduates.

Source of Data: A simple questionnaire was sent to 120 graduates of the classes from 1946 to 1949.

Findings and Conclusions: Educational and vocational guidance are lacking. Inclusion of general math, commercial subjects, speech, extra-curricular activities, and the functional approach was emphasized by the respondents. St. Joseph as a school for Negroes could be tied in more closely to its community through a better and more elaborate program of guidance.

734. NICHOLS, DWIGHT L. *A Follow-Up Study of Graduates of the Las Vegas High School for the Years 1929–1938.* M. A., University of Colorado, 1941. 65 p.

Results of the study indicate that some changes in the curriculum, the development of a planned guidance program, and the organization of student government in the school would be desirable.

735. **NOAKES, GEOFFREY BERTRAM.** *A Follow-Up Study of Industrial Arts Graduates With Reference to Factors Affecting Their Success.* M. A., 1954, Fresno State College. 68 p. Library, Fresno State College, Fresno,, Calif.

Purpose: To analyze the reactions of industrial arts graduates to their college training, their economic status, and working conditions in the teaching profession.

Source of Data: Data were obtained through questionnaires mailed to 62 industrial arts graduates. A "job satisfaction score" was arrived at by using methods employed in other studies.

Findings and Conclusions: All but two individuals liked teaching. None had left teaching jobs to go into industry. The greatest dissatisfaction was registered in the categories of salaries and teaching loads, and lack of free periods. Administrators' understanding of the objectives of industrial arts was rated very low.

736. **OGDEN, LYNN (M. Ed.)** *Employment Failures of Augusta Vocational School Graduates.* Colorado Agricultural & Mechanical College, 1948. 65 p.

A study of the group of Augusta Vocational School graduates who fail to hold positions. The problems of these persons are discussed and recommendations are offered advising the school on ways to meet these problems.

737. **RHODES, ROBERT R.** *A Follow-Up Study of the Graduates of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma. From 1930 to 1950.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 28 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the present status of the graduates and the extent to which their training has been utilized.

Source of Data: Data were secured from questionnaires mailed to 179 graduates and from the official convocational listing of graduates, personal files in the School of Trade and Industrial Education, and personal interviews.

Findings and Conclusions: Two hundred and nine degrees were given by Oklahoma Agricultural and Mechanical College to 203 graduates of the School of Trade and Industrial Education. Seventy-three Bachelor of Science degrees and 136 Master of Science degrees were granted by the college. The majority of the graduates are employed in teaching professions and related fields. One hundred thirty-three of the graduates are located in Oklahoma. The School of Trade and Industrial Education graduates are now employed in 55 different occupations.

738. **SANDEEN, ERNEST.** *A Follow-Up Study of the Carpenters' Apprenticeship Program in the Twin Cities District Area—1945–50.* M. A., 1951, University of Minnesota. 71 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To evaluate the carpenters' apprenticeship training programs.

Source of Data: Data were obtained from records and questionnaires.

Findings and Conclusions: The interrelated nature of school and on-the-job training has made the apprenticeship program effective and successful. The carpenter apprenticeship training program now in operation is successful in producing proficient journeymen.

739. **SEELEY, GILBERT E.** *A Study To Determine How Adequately Jackson Public Schools Are Training Their Youth for Jobs in Industry.* M. A., University of Michigan, 1947. 36 p.

A study of how well high-school graduates are adjusting to work in industry. Results are based on reports from the industries where most of the graduates find employment.

740. **SELSKY, S. SAMUEL (M. A.).** *A Vocational Follow-Up of Former Students of General Vocational School No. 57. (Baltimore, Maryland).* University of Maryland, 1942. 46 p.

An investigation of the employment status of former students who attended the school during the 1937–38 and 1938–39 school years. The results offer an objective means of appraising the curriculum.

741. **SHERMAN, DOUGLAS.** *A Follow-Up Study of the Graduates of the Alpena High School During the Years 1940–1949 Who Later Attended Col-*

lege. M. S., 1952, Stout State College. 62 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain the relationship existing between grades earned at the Alpena, Michigan High School and those earned at college.

Source of Data: Data were obtained from published materials and from official records. Coefficients of correlation and regression equations were used to measure relationship.

Findings and Conclusions: The coefficients of correlation obtained in this study were somewhat lower than those obtained by other investigators. The various high school areas are quite outstanding and the Alpena High School graduates are best prepared for those schools which they attend with greatest frequency.

742. **SMALLEY, LEE HAROLD.** ***Follow-Up of Industrial Arts Education Graduates: The Status of One Graduating Class in a Selected Institution Five Years After Graduation.*** **M. Ed., 1955, University of Maryland. 28 p. Department of Industrial Education, University of Maryland, College Park.**

Purpose: To ascertain the status of one graduating class five years afterwards.

Source of Data: Data were obtained by a questionnaire and University files.

Findings and Conclusions: No significant difference appeared between those who remained in teaching and those who took jobs in business and industry as regards their undergraduate scholastic achievement. The most significant difference between the two groups was in income: the lowest paid person in business or industry received more than the highest paid teacher. All teachers, except one, reported supplementing their incomes, but no person otherwise employed reported doing so. One-half the persons in non-school employment went into such work immediately after graduation; the other half entered teaching first. Those who taught or who are teaching report the following advantages: personal satisfaction, working with students, security, summer vacations, good working conditions, fellowship with fellow teachers. Disadvantages cited were: low pay, extra duties, crowded conditions, lack of discipline, lack of equipment, supervisory people difficult to work with, limited possibilities of advancement. Advantages cited for business and industry: higher pay, opportunity for advancement, no extra duties, personal satisfaction. Disadvantages include: shorter vacations, more pressure, less security, irregular hours, less professional attitude.

743. **SMITH, G. M. (M. S.).** ***The Preparation of Boys Who Leave the Waco High School to Enter Employment.*** **A & M College of Texas, 1937. 35 p.**

A follow-up study of boys who graduated from the Waco High School in 1936 and entered employment. The study shows the need for a reorganized curriculum based on out-of-school needs of graduates.

744. **THOMA, JACK E.** ***A Study of the Occupational Adjustment of the Graduates of the Class of 1935 of Grand Haven (Michigan) High School.*** **M. A., University of Michigan, 1942. 60 p.**

An attempt to find out the effectiveness of high-school preparation for occupational adjustment in a graduating class in 1935.

745. **THOMAS, HARRY OSCAR (M. S.).** ***A Study of the Isaac Delgado Central Trades School Graduates From June 1933 to June 1937.*** **Louisiana State University, 1939. 78 p.**

A follow-up study of trade school graduates, with special reference to adequacy of training, employment conditions, and earnings.

746. **THOMAS, WARREN G.** ***A Follow-Up of the Graduate Students of the Stout Institute with a Major in Industrial Education 1938–1949.*** **M. S., 1950, The Stout Institute. 118 p. Library, The Stout Institute, Menomonie, Wisconsin.**

Purpose: To ascertain whether students who had participated in the graduate program at Stout could make a significant evaluation of their advanced training. To discover ways of improving services to the graduates in the field as a result of study.

Source of Data: This investigation is a follow-up of the men who have received the degree of master of science in industrial arts or vocational education from the Stout Institute during the fourteen-year period 1935–1949.

Findings and Conclusions: A nine-page questionnaire was mailed to 151 available persons; replies were received from 131 graduates, or an 86.8 percent return. Thirty-three tables which range in length from one-half page to seven pages present the resultant data.

747. UDOH, BENSON AKPAN. *Industrial Education Baccalaureate Graduates of Iowa State College From 1921 to 1950.* M. S., 1952, Iowa State College. 73 p. Library, Iowa State College, Ames.

Purpose: To follow up the industrial education graduates of Iowa State College to learn their location, occupation, and plans for further education.

Source of Data: Data were secured through questionnaires from 225 graduates who had obtained Bachelor of Science degrees during the period of 1921 to 1950.

Findings and Conclusions: Of the graduates reporting, 62.4 per cent were located in Iowa, and 67.6 per cent were engaged in teaching. Of those teaching, 64.8 per cent were teaching only industrial arts; 35.2 per cent were teaching a combination of subjects. Of the 73 nonteachers, 35 were working in industry, 26 were in business, one was in school, 10 were in military service, and one was engaged in farming.

748. VAN METER, LOREN (Masters). *An Occupational Follow-Up of 383 High School Graduates to Discover Relationships between School and Career and to Learn Any Implications for the Current Curriculum Particularly Industrial Arts.* Ohio State University, 1940.

749. VON BEHREN, ALWIN FRED. *A Follow-Up Study of the Graduates of East Lynn, Illinois, Township High School for the Years, 1926–1939.* M. Ed., University of Colorado, 1940. 59 p.

A study was made to determine the effect of a high-school program on vocational, social, leisure-time activities, and continued learning adjustments of graduates. Results show that the program has a great deal of general but little specific effect on later adjustments except in agriculture and home economics. Satisfactory vocational adjustments take place some time after graduation.

750. WAGNER, FREDERICK L. *An Occupational Follow-Up Study of the Graduates of Wayland High School From 1936–1941, Inclusive.* M. A., University of Michigan, 1942. 57 p.

A study of the students graduated from Wayland High School, during years 1936–41, inclusive, with special reference to their occupational adjustment.

751. WALLACE, GEORGE EDWARD. *A Ten Year Follow-Up Study of Monroe Trade School Students From Sept. 1940 to Sept. 1950.* M. S., 1953, Virginia Polytechnic Institute. 167 p. Library, Virginia Polytechnic Institute, Blacksburg.

Purpose: To ascertain what the former students of Monroe Trade School had done after leaving school, and what they were doing at the time of the study.

Source of Data: Data were secured through school records, personal interviews, and questionnaires from 190 of the 548 students who had successfully completed one semester or more of work at the Monroe Trade School, Lynchburg, Virginia.

Findings and Conclusions: After leaving school, 20.7 per cent attended college, 17.0 per cent took some type of correspondence course, 15.8 per cent took on-the-job training, and 12.6 per cent entered some type of apprenticeship. Forty-six (46) per cent of those attending college graduated. All respondents were employed. Shop mathematics, general mathematics, English, and algebra were considered the most important subjects taken. The day trade courses offered were meeting present day needs, but they should be supplemented by appropriate types of training beyond high school.

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752. WIEHE, THEODORE, E. *A Follow-Up Of Engineering Drop-Outs, University Of Missouri, 1947–1952.* Ed. D., 1954, University of Missouri. 131 p. Library, University of Missouri, Columbia.*

Purpose: To make available information concerning the educational and occupational activities of the engineering drop-outs of the University of Missouri prior to, during, and after attendance in the College of Engineering, to learn the reason why students drop out, and to secure opinions and suggestions for improvement of the program.

Source of Data: Data were obtained from records in the Engineering Dean's office, office of the Director of Admissions, and from information forms checked by 425 of 1478 drop-outs of the College of Engineering. The data were analyzed for number and percentage of response to each item. Correlation techniques were used.

Findings and Conclusions: No correlation was found to exist when the number of semesters completed and grade point average earned in engineering were each compared to percentile rank in high school, size of high school graduating class, intelligence scores, and wages earned per week after dropping out. The most frequent reason for dropping out was "discouragement due to low grades". Drop-outs lacked proper guidance and preparation for engineering. Many students drop out even though successful in the Engineering College. Many want practical engineering problems earlier in their engineering training. There is a tendency for drop-outs to go into semi-professional industrial jobs. Many drop-outs would like opportunity to enroll in two-year or semi-professional courses of a technical nature.

753. WILLIAMS, G. ERIC. *A Follow-Up Study of Vocational Trade and Industrial Graduates of Harding High School, Marion, Ohio.* M. A., 1949, Ohio State University. 74 p. Education Library, Ohio State University, Columbus.

Purpose: To determine to what extent and how well the graduates of the trade and industrial courses have been able to use the training they received while in school.

Source of Data: Data were secured by means of a questionnaire and personal interview.

Findings and Conclusions: Training received while in school met the needs of graduates. Over 68 percent are working in the mechanical trades. Graduates have had additional training since entering employment in local industries. The vocational program has fulfilled an obligation to the students by preparing them to adjust themselves to a tcehnological society, earn a living, and make a worthwhile contribution to society.

Occupational Information

754. BARICH, DEWEY FREDERICK. *Educational Implications of the Occupations in One Division of the Automobile Industry in Flint, Michigan.* M. A., University of Michigan, 1939. 45 p.

A study of 27 occupations in a plant engaged in manufacturing automobile parts and accessories. The data gathered would be useful for vocational guidance purposes in local schools since employment opportunities, wages, education needed, and other factors are included in the study.

755. HOUSE, GUY F. (M. A.). *Study of Occupational Information Needed in Vocational Guidance of the Youth of Kansas City, Kansas.* Colorado Agricultural & Mechanical College, 1936. 70 p.

A study of employment conditions, standards, and procedures of beginners in five leading lines of employment in Greater Kansas City to determine what information could be used in setting up a classroom program in occupations or in vocational guidance.

756. LEISSNER, RICHARD, *Jr.* (M. S.). *The Place of Industrial Arts in the Industrial Arts Program of the Junior High Schools of Southern California.* University of Southern California, 1935. 70 p.

A study of the place of the industrial arts department which is not itself engaged in guidance but which contributes to guidance in the junior high school through its exploratory functions.

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757. LOWENSTEIN, NORMAN. *The Effect of an Occupations Course in High School on Adjustment to College During the Freshman Year.* Ph. D., 1955, New York University. 95 p. Library, New York University, New York.*

Purpose: To compare an experimental group of college-preparatory students who took an occupations course with a control group of similar students who had not taken the occupations course.

Source of Data: Data were obtained by personal interview and examination of students' college transcripts for their freshman year.

Findings and Conclusions: Students in the experimental group achieved a higher average honor point ratio and participated in more extra-curricular activities during the freshman year. A much higher percentage of the experimental group indicated they had based their vocational decisions on information received from people in the various fields rather than upon the advice of parents or close relatives. The occupations courses enabled the students in the experimental group to make a better adjustment to college during their freshman year than had they not had the course.

758. LUDINGTON, DON CLUFFORD (M. A.). *Presenting Occupational Information in Industrial Arts Program.* George Peabody College, 1930. 76 p.

A study of the problem of gathering, organizing, and arranging occupational information to be used in an industrial arts program in an effort to show how information of a specific nature may be attained to fit each local situation.

759. MILLER, EVERETT R. (M. S.). *The Relationship Between Industrial Arts Courses and Occupational Choices.* Colorado Agricultural & Mechanical College, 1940. 89 p.

An investigation of two groups of students to determine whether industrial arts aids students in selecting an occupation. The results are applied to the Dunwoody Institute.

760. MINER, HARVEY D. (M. Ed.). *Contributions to the Guidance Program Made by the Industrial Arts Program.* Ohio University, 1947. 117 p.

An attempt to show how industrial arts courses may be helpful to both pupil and counsellor in guiding the pupil to advanced educational opportunities. Data were taken from a questionnaire survey of the writer's students.

761. NESBIT, KENNETH W. *Relating Vocational Guidance to the High School English Program for Seniors.* M. Ed., 1950, Saint Louis University. 59 p. Library, Saint Louis University, Saint Louis, Missouri.

Purpose: To suggest a plan for correlating vocational guidance with the English course in the senior year of high school.

Source of Data: An analysis of the possibility of relating vocational guidance to senior English and an integration with the units in the syllabus for Tressler's English in Action.

Findings and Conclusions: Where no alternative presents itself, vocational guidance information may be successfully presented by correlating it with the course in English. The instructor in such a combination course should be well-informed in both English and vocational guidance. The need of becoming a wage-earner being rather real to the high school senior, properly handled, a course of this type should afford intrinsic motivation.

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762. OAKLEY, HUGH L. *The Relation of Guidance and Concomitant Attitudes to Specialized Trade and Industrial School Training in Kansas City.* Ed. D., 1954, University of Missouri. 216 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain the bearing of guidance and concomitant attitudes of students, principals, vice-principals, counselors, teachers, and parents of the Kansas City, Missouri, Public Secondary Schools on the operation of the Trade Preparatory Division of the Manual High and Vocational School of that city.

Source of Data: Data were obtained from school records and information forms from individuals of the white public secondary schools of Kansas City, Missouri, as follows: 686 general high school students; 171 trade preparatory students; 80 trade preparatory drop-outs; 73 trade preparatory parents of Manual High and Vocational School; nine principals, nine vice-principals, nine counselors; 153 teachers, and 294 parents of the regular junior and senior high schools.

Findings and Conclusions: Less than half the general high school students had made an occupational choice. Chief reasons why more students had not selected their occupation were lack of occupational information and vocational counseling. Both the general high school and trade preparatory students consider trade preparation worthwhile, but only a small percentage expect to pursue such training at Manual High and Vocational School. They believe that such courses should be offered in the regular high school or in a more modern technical high school. A large majority of the students who drop out of the trade preparatory program do so during or by the end of their first year of training and only a small minority work in the trade for which they had trained at Manual. Principals, vice-principals, counselors, teachers, and parents consider trade preparatory training worthwhile for non-college bound youth; they believe such courses should be offered in the regular high school. Principals, vice-principals, counselors, and general high school parents believe that the trade preparatory program at Manual High and Vocational School has not been successful in meeting the needs of youth with respect to that type of training. Trade preparatory parents believe the program has been successful. Principals, vice-principals, and counselors believe the public schools of Kansas City have been fairly successful in providing vocational guidance relating to occupations and trade preparatory training. The teachers' opinions were to the contrary.

763. **PAINE, JOSEPH C.** (Masters). *Occupational Information and Trade Knowledge for an Industrial Arts Course in Woodworking for Junior High Schools.* New York University, 1930.

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764. **RELYEA, GLADYS MILDRED** (Ed. D.). *The Clinical Laboratory Technician: An Occupational Analysis.* Stanford University, 1937. 166 p.

An analysis of the occupation of laboratory technician to provide information for those considering entrance in the occupation. It aims to aid in counseling and guidance work also.

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765. **ROBINSON, CLARK NORVAL** (Ed. D.). *A Method for Obtaining Occupational Information of Value to the School.* Stanford University, 1947. 114 p.

A study showing method of obtaining employment information from occupation-centered and industry-centered data.

766. **ROLLINS, C. WALLACE.** *A Study of What Graduating High School Seniors Know About Their Claimed Occupational Choice.* M. S., 1950, University of Utah. 91 p. Library, University of Utah, Salt Lake City.

Purpose: To ascertain amount and kind of information possessed by a group of graduating high school seniors regarding their claimed occupational choice.

Source of Data: Data for this study were obtained from questionnaires submitted to the 1949 graduating class of West High School, Salt Lake City, Utah.

Findings and Conclusions: Eighty-one percent of the seniors questioned claimed they had made an occupational choice. Of those claiming occupational choices, most of the choices fell into the middle and upper categories of the economic scale. No choices were made in the domestic services or unskilled occupations. Of those making choices 65.8 percent chose occupations which require training beyond high school, ranging from 6 months to 7 years. One-third of the occupations averaged 4 years of college work or more. About 67.6 percent of the students making choices believed that they had sufficient information to choose wisely, even though they could answer only 46.8 percent of the questions in the questionnaire correctly. Most students had little realistic information about the cost of training.

767. **STONE, WEBSTER H.** (Masters). *Occupational Exploration as a Function of Junior High School Industrial Arts.* University of Wisconsin, 1930.

768. **TEEL, J. S.** *Occupational Information For the Automobile Mechanics Trade.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 28 p. School of Trade and Industrial Education, Oklahoma Agricutural and Mechanical College, Stillwater.

Purpose: To compile authentic and reliable information concerning automobile mechanics as a trade.

Source of Data: An examination of the published work of private individuals and Government publications, and interviews with workers in the trade and personnel of the United States employment offices.

Findings and Conclusions: No standard requirements exist for entrance into the trade, but general agreement prevails regarding the necessary entrance qualifications. The overall good features of the trade make it attractive as a lifetime work. The trade can be learned by a worker on the job, but his training can be facilitated through courses set up for teaching the trade. The outlook for additional workers is good.

769. **THOMPSON, CHARLES H.** *Employment Opportunities and Training Needs for Draftsmen in Oklahoma.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 64 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain what industry considers the most useful and desirable skills of beginning draftsmen, and to ascertain whether the present training program for draftsmen measures up to the needs of industry.

Source of Data: Questionnaire sent to 120 chief draftsmen.

Findings and Conclusions: Machine drafting presents the greatest opportunities for employment, structural drafting, second, and pipe drafting, third. The drafting student should be trained in lettering, and the draftsman should be trained in both vertical and inclined lettering. The draftsman should be trained in the technique of both pencil and ink tracing.

A knowledge of shop processes is one of the most important accomplishments which a draftsman can attain. Students are adequately prepared in the field of machine drafting. Students are not adequately prepared in structural drafting.

770. VAN WESTRIENEN, HAROLD J. *Study of the Vocational Guidance Value of Industrial Arts Try-Out Courses in the Junior High School,* M. A., University of Michigan, 1934. 141 p.

An attempt to discover changes in students' occupational choice as influenced by each of 8 industrial arts exploratory courses. Each course was for 1 hour per day for 10 weeks. Responses were taken following each course and summarized on a special form to determine changes in response.

771. WEBB, CECIL S. (Masters). *Influence of Courses in Occupations Upon the Vocational Choices of the Pupils of Jefferson High School, Lafayette, Indiana.* Indiana University, 1931.

772. WRIGHT, LYLSE R. *Vocational Opportunities in Radio.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 43 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To assemble pertinent occupational information on all important jobs in radio; qualifications required or needed for employment in various radio jobs, nature of the work, and advantages of jobs in the radio field.

Source of Data: Examination of books, pamphlets, occupational briefs, and house organs relating to work in radio.

Findings and conclusions: At present there are 35 main kinds of radio jobs in the United States. Employees in these jobs were found to work in 10 major types of employment. Jobs with airline companies and radio broadcasting stations were among the most sought after. Workers in companies manufacturing radio and electronic equipment were, generally, receiving the highest wages.

Selection and Placement

773. BOLAND, MARGARET M. (Masters). *Vocational Training Centers and Placement Agencies for Girls in St. Louis.* St. Louis University, 1942.

774. BOSTWICK, HAROLD S. (Masters). *A Study to Determine the Extent to Which the Graduates of the Eddystone Vocational High School Machine Shop Curriculum, 1934–38, Secured Jobs in the Metal Working Trades.* University of Pennsylvania, c. 1935–47.

775. CLARK, H. M. (M. S.) *A Study in Guidance-Methods for Selecting Boys for Vocational Classes Best Suited to Their Interests and Aptitudes.* The Stout Institute, 1940. 84 p.

Through a survey of directors and co-ordinators of vocational schools in Wisconsin, the author suggests a chart for the classification of boys in trade courses and points up the need for a statewide guidance program.

776. FICK, SAMUEL LEONARD (M. S.). *An Evaluation of the Efficiency of Vocational Training and Placement of the Graduates from Certain Los Angeles City High-School Vocational Classes.* University of Southern California, 1938. 70 p.

A study of the placement of graduates of Los Angeles city schools in relation to their vocational training.

777. FLOOD, JAMES JULIUS. *A Study of the Vocational Guidance Program of Tuskegee Institute,* M. A., University of Michigan, 1941. 71 p.

A systematic study of more than 400 graduates reveals that most of these young men and women are employed in the fields for which they received training in schools. The study was made with particular respect to placement and follow-up.

778. GRAVES, OLIVER R. (M. S.). *The Selection of Youth in the Manufacturing and Mechanical Industries of Birmingham, Alabama.* Colorado Agricultural & Mechanical College, 1939. 110 p.

A survey of six basic trades and fifty-nine industries to determine the basis of selection of apprentices in the manufacturing and mechanical industries of Birmingham and to establish and recommend criteria for selecting students in the Paul Hayne Vocational School, Birmingham.

779. **HALL, WHEELER M. (M. Ed.).** ***Vocational Adjustments in the Batavia Area.*** **University of Buffalo, 1943. 153 p.**

A study of the post-school employment histories of 1,627 residents of the Batavia, New York, area in an effort to determine the factors which influenced the vocational adjustment of the individuals.

780. **HARPER, WILLIAM V.** ***The Selection and Guidance Program of the Department of Industrial Education, Chrysler Corporation, Detroit, Michigan.*** **M. Ed., 1948, Wayne University. 53 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To examine and evaluate the Chrysler plan for the selection and guidance of employees as it affects college co-operative students and plant employees.

Source of Data: Data were obtained from the Department of Industrial Education and the Department of Selection and Guidance, Chrysler Corporation.

Findings and Conclusions: Trainees who have taken the battery of tests and are recommended by the Department of Selection and Guidance of the Chrysler Corporation are more satisfactory as employees. Educators should take advantage of the opportunities offered by industry and make studies of the various methods used by industry to select, guide, and train its personnel.

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781. **HENRY, GEORGE F.** ***Techniques for Selection and Guidance of Graduate Students in Industrial Arts Education.*** **Ed. D., 1954, University of Florida. 202 p. Library, University of Florida, Gainesville.**

Purpose: To investigate practices used to determine the fitness of a student to pursue a graduate program, and to ascertain techniques of selection employed to locate the student in the program.

Source of Data: Data were secured from literature relating to admission practices and techniques for selection, analysis of graduate catalogs, and a questionnaire to graduate deans and directors of graduate study.

Findings and Conclusions: A detailed list of techniques for selection and guidance of graduate students is suggested. It is recommended that more emphasis be placed on individualized selection in light of the conclusion that problems are individual in nature.

782. **HOWELL, TILLIE D. (Masters).** ***The Relation of Interests to Success in Electrical and Automotive-Trades Training.*** **University of Cincinnati, 1930.**

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783. **JOHNSON, RUFUS C.** ***A Study of Selection and Guidance Procedures for Students in the Program of Industrial Arts Teacher Education at the State Teachers College, Cheyney, Pennsylvania.*** **Ed. D., 1949, Pennsylvania State College. 169 p. Library, Pennsylvania State College, State College.**

Purpose: To ascertain the current admission practices in industrial arts teacher education programs on a national basis. To discover background factors, interests, and achievements of the students included in the study in an effort to reach a better understanding of those being taught and to help determine their probable fitness as prospective industrial arts teachers. To offer recommendations for improvement of the selection and guidance at Cheyney.

Source of Data: The construction of a questionnaire and an analysis of the returns covering admission practices in industrial arts teacher education programs. The preparation and use of an interview guide, the conducting of personal interviews with 40 students in the study, and an analysis of these findings. The development and administering of a test battery which included mechanical aptitude, intelligence, personality, educational achievement, health, and vocational interest tests. Tabular and graphic arrangement of results of the testing items listed above, including a summarization in the form of student profiles.

Findings and Conclusions: Admission Practices: There appears to be a wide variation in admission practices among the 100 institutions reported in this study. This holds true, also, for colleges and universities within a given State. The number of specified requirements for admission to industrial arts teacher education ranged from 1 to 8. The 4 most frequently used admission requirements are health examination, high school standing, judgment of high school teachers and/or principal, and intelligence tests. Nineteen per cent of the institutions required graduation from high school only (or its equivalent in several instances). Testing Program: There is a wide range of intelligence, silent reading ability, personality adjustment, health status, interests, and performance on mechanical aptitude tests among the Cheyney freshman and sophomore indusrial arts students. For the most part the non-language quotients are higher than the language quotients in the test on mental maturity. Uniformly low scores are found for both groups on the numerical reasoning sub-tests on mental maturity. Self-adjustment percentile ranking exceed, in most cases, the social adjustments rankings on the personality test. Approximately one-half of the students of each class show some major physical defects. Interviews: A definite sense of the importance of the industrial arts curriculum was manifested. About one-half of the 40 students interviewed stated that they feel that they could succeed as industrial arts teachers chiefly because of their interest and ability in the field and their previous experiences in related work. On the other hand, the other half feel that they might be successful in the teaching of specific shop courses, but express apprehension about their ability to succeed in general academic subjects. Recurring reference was made to what the students considered to be the inadequacy of the high school industrial arts set-up and teaching. The two high school shop and related subjects reported as "most difficult" were electricity and mathematics. The two high school shop and related subjects reported as "most interesting" were woodwork and mechanical drawing. The 3 most frequent sources of guidance influencing the student's decision to enter industrial arts were high school, alumni of the college, family, and others.

784. KAISER, DONALD W. ***Placement of Recent Graduates of Industrial Teacher Education Programs in Michigan.*** **M. Ed., 1955, Wayne University. 39 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To ascertain the number of graduates of industrial arts and vocational-industrial teacher education programs going into work other than teaching.

Source of Data: Data were obtained through a questionnaire sent to each of the 1954 graduates from the leading teacher training institutions of Michigan in the fields of industrial arts and vocational-industrial education.

Findings and Conclusions: Approximately 22 per cent of the graduates entered work other than teaching. The armed forces took 14 per cent of this 22 per cent, leaving only 8 per cent who voluntarily entered work other than teaching. Few graduates of industrial education teach a minor subject. All graduates had a teaching offer. The salary offered these 1954 graduates seemed to be the controlling factor in their choice of work. Many school systems do not have a salary schedule and those who were not teaching indicated they would have preferred to teach had financial inducements been comparable.

785. KEEHAN, VIRGINIA R. ***Occupational Choices of Seniors of Boulder High School in Relation to Job Opportunities and Current Trends.*** **M. P. S., University of Colorado, 1948. 56 p.**

A study of occupational choices made by 208 senior students of Boulder (Colo.) High School in order to show the relationship to job opportunities and to indicate educational needs of the school in light of student data and current educational practices in other comparable schools.

786. LERNER, LEON LELLAND. ***Public School Activity in the Job Placement of Youth.*** **M. A., University of Maryland, 1948. 106 p.**

A study describing the status of public school job placement activities in cities of the U. S. with populations of 100,000 and over.

787. LINGG, W. A. (Masters). ***What Proportion of the Graduates in Electrical Construction at Northeast High School, During the Past Four Years, Are Actually Engaged in Some Phase of Electrical Work?*** **University of Pennsylvania, c. 1935–47.**

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788. MOUTOUX, ALFRED CARL (Ed. D.). ***The Selection of Students for Trade-Preparatory Courses.*** **Indiana University, 1948. 193 p.**

An evaluation and analysis of factors commonly used in the selection of students for trade-preparatory courses and the subsequent development of a practical plan of selection. The findings and recommendations are based on a study of 422 boys attending Mechanic Arts School between January 1940 and June 1945.

789. MURBACH, NELSON (Masters). ***Selection of Students Entering a Metal Trades Vocational School.*** **University of Buffalo, 1943.**

790. **OPPERMAN, WILLIAM F.** (M. S.) *Training and Placement.* Colorado Agricultural & Mechanical College, 1932. 261 p.

A study of school placement and counseling. A program for establishing a school placement department is offered.

791. **RICKERT, CHARLES HOBART.** *A Study of the Vocational Careers of the 1925–1934 Graduates and Non-graduates of Naperville High,* M. A., University of Michigan, 1936. 66 p.

A study to gather primary facts concerning the vocational careers of graduates and non-graduates of Naperville (Ill.) High School during the 10-year period from 1925 to 1934. This covers 1,000 students who entered school, 629 finishing, and 371 dropping out before receiving a diploma.

792. **ROBBINS, CLARENCE EARL** (M. A.) *The Influence of Industrial Arts Training on the Subsequent Occupations of the Graduates of Central High School, Fort Wayne, Ind., for the Period 1932–40.* Indiana State Teachers College, 1942. 146 p.

An analysis of questionnaires and interviews of boys who had completed an industrial arts course in an effort to gather information that would be helpful in improving the industrial arts program.

793. **ROENIGK, JOSEPH A.** (Masters). *Factors in the Selection and Adjustment of Students in a Trade School.* Ohio State University, 1942.

794. **SCHAEFFER, R. B.** (Masters). *A Study to Determine the Extent to Which Graduates of the Building Construction Curriculum in the South Philadelphia High School Find Employment in Carpentry or Allied Trades.* University of Pennsylvania, 1935.

795. **WOOLDRIDGE, ROBERT.** *Placement and Follow-up of Trade and Industrial Education Graduates From the Modesto High School.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 68 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To describe the methods used by Modesto, California High School in initial placement of its graduates and to suggest ways of improvement in follow-up procedures.

Source of Data: Data were obtained through questionnaires sent to graduates and to state and local supervisors in twenty-two states, and interviews with local supervisors and instructors.

Findings and Conclusions: Of the graduates, 13.7 per cent were working in the trade for which they were trained, 8.2 per cent were working in related trades, 15.0 per cent were working in unrelated trades, and 57.5 per cent were in the armed forces. Considerable improvement can be made in the follow-up program of the Modesto High School.

History and Trends

General

796. **ABEL, ALLISON A.** (Masters). *A History of Industrial Arts in the Public Day Schools of Ohio as Indicated by Official School Reports to 1922.* Ohio State University, 1933.

797. **ACKLEY, WILLIAM J.** *A History of the Growth and Progress of the Edison Technical and Industrial High School, Rochester, New York.* M. A., University of Rochester, 1936.

A historical account of the development of a vocational-industrial high school from 1908 to 1936. Since this school was one of the first public high schools in the field of vocational education, its growth is particularly significant.

798. **ALDERSON, GLENN A.** (M. S.). *Trends in Industrial Arts Teacher-Training Curricula for the Past Ten Years.* Iowa State College, 1932, 51 p.

A survey of twenty midwest teacher training institutions from 1922 to 1932 to discover trends. The curricula of the colleges are compared.

799. ANDERSON, BERNHARD THEODORE (M. A.). *The History of Vocational Education Among the Seventh-Day Adventists.* Catholic University of America, 1938. 75 p.

An historical study of the subject based on the results from a questionnaire and a review of the literature. Emphasis is given to the period after 1850 with a brief consideration of ancient vocational education.

800. ANDRUS, OLIVE POWE (M. A.). *Isidore Newman School (New Orleans) and the Manual Training Movement.* Tulane University, 1938. 100 p.

A study of an early manual training school of the South, showing adaptations to local conditions and its influence on education in the city.

801. ANGELBECK, FIDELIUS EDWARD (M. S.). *History of Industrial Arts Education in the High Schools of Milwaukee, Wisconsin.* Iowa State College, 1936. 80 p.

A study of the history of manual training in the Milwaukee schools. It traces the development from 1891 when manual training was begun as an experiment on a one-year basis and includes: subjects and courses, teachers, aims and objectives, motive power and equipment, and supervision and administration.

802. APPLEBEE, WENDELL T. (M. Ed.). *War Time Aspects of Trade and Technical Education in New York State.* University of Buffalo, 1944. 96 p.

An historical account of war training programs in New York State during the war years. It includes case studies of various communities and how they assisted the war effort by their training programs.

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803. ASHBROOK, WILLIAM D. (Ph. D.) *The Development of Industrial Education in the Schools of Pennsylvania.* University of Pittsburgh. 1944.

A detailed account of the evolution of industrial education in Pennsylvania from its beginning.

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804. BARLOW, MELVIN L. (Ed. D.). *A History of Trade and Industrial Education in California.* University of California at Los Angeles, 1949. 325 p.

A review of the general history of trade and industrial education in the United States from 1800 to 1917 and in California from 1854 to 1947. Such topics as the development of the philosophy of industrial education in the California state administration of trade and industrial education and teacher training are discussed.

805. BASHFORD, THEODORE WALTER. *Industrial Arts Laboratory Library.* M. A., Kent State University, 1941.

A history of the industrial arts laboratory library from its early stages up to the present time.

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806. BATESON, ROBERT EDWARD. *A Study of the Growth and Development of the Teacher Training Program For Vocational-Industrial Education in Connecticut.* Ed. D., 1951, New York University. 339 p. Library, New York University, New York.*

Purpose: To investigate the growth and development of the teacher training program for trade and industrial education in Connecticut. To ascertain the major forces, events, and personalities that have contributed to this development.

Source of Data: Data were secured through a combination of historical and normative-survey methods using records and documents of the Connecticut State Library, State Department of Education, Histories of Connecticut, Connecticut Manufacturers Association, Connecticut Department of Labor, and other sources.

Findings and Conclusions: Poor soil caused Connecticut to turn to an industrial economy. This led to the development of highly technical skills. This changing to an industrial economy caused a dislocation of education and training. State trade schools were founded to train workers. Craftsmen were called upon to teach. Since they had no training to teach this led to the development of a teacher training program for these instructors.

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807. BAUER, CARLTON EDWARD. *A Study of the Arts and Crafts Movement and of Art Nouveau in Relation to Industrial Arts Design.* Ph. D., 1955, New York University. 258 p.

Library, New York University, New York.*

Purpose: To investigate the Arts and Crafts Movement, Art Nouveau, and the Manual Training Movement in the United States with special emphasis on the period from 1890 to 1910.

Source of Data: Data were secured from periodicals, reports, catalogs, illustrations, historical and critical studies of the period. The material was treated comparatively and presented as an historical narrative.

Findings and Conclusions: The Arts and Crafts Movement was shown to have had two purposes: to promote forthright and honest design; and to overcome the ills of the industrial age by bringing about a new social order where the worker would be free to create objects of beauty. Art Nouveau was shown to have been a movement of revolt against tradition, but, also, a movement of exploration and growth. Manual training was shown to have been mixed in its objectives. The use of arts and crafts forms with their emphasis on medieval treatment and the anti-industrial philosophy of the Arts and Crafts Movement were shown to have been unrealistic and ill suited to the objectives of manual training. Much closed integration of design with the development of projects to meet the aims of manual training was indicated as desirable especially in the training of teachers.

808. BAXTER, WILLIAM THOMAS (M. A.). *Status of Industrial Arts in Virginia.* George Peabody College, 1931. 81 p.

A study of the growth of the industrial arts program on the secondary level in the state of Virginia. Consideration is given to the curricula offered and the training of the industrial arts teacher.

809. BECKNER, VIRGIL D. (Masters). *An Historical Study of Diversified Education Training in Plant City High School.* University of Florida, 1942.

810. BENCKER, WILLIAM L., *Jr. Industrial Arts in the Curriculum of the Public Schools in the United States.* M. S., 1952, University of Tennessee. 61 p. Library, University of Tennessee, Knoxville.

Purpose: To trace the history of industrial arts in the public schools of the United States, and to examine objectives and present trends.

Source of Data: Data were obtained from Standards of Attainment in Industrial Arts Teaching, and other written materials.

Findings and Conclusions: The history and objectives of industrial arts have been subject to continued change. Industrial arts is now recognized as being a subject capable of realizing the objectives of general education. These trends as summarized show an increased number of areas, the acceptance of the general shop plan, and an emphasis on the teaching of informational material.

811. BENSON, ROBERT J. (M. S.). *The Twenty-Four Leading Contributors to Industrial Education in the United States Since 1920.* Wayne University, 1937. 142 p.

A biographical study of the contributions of leaders who, by their specific accomplishments in professional writing, have given direction to the advancement of industrial education.

812. BILDERBACK, C. S. (Masters). *Fifteen Years of the Smith-Hughes Law in Illinois, 1917–1932.* University of Chicago, 1932. 100 p.

813. BISHOP, AIDA C. (Masters). *The Development of the Continuation School in Pittsburgh, Pennsylvania.* University of Pittsburgh, 1932.

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814. BLACKBURN, SAMUEL ALFRED (Ph. D.). *The Development of Vocational Education in Texas.* The University of Texas, 1930. 306 p.

A critical study of the development and nature of vocational education in Texas. Legislation and statistics bearing upon the educational activities up to 1930 are discussed and curricula are compared. Possible relationships with respect to sociological data are considered.

815. BLANKENSHIP, W. A. *Teaching of Ceramics in the Field of Industrial Arts.* M.A., 1949, Sul Ross State College. 106 p. Library, Sul Ross State College, Alpine, Texas.

Purpose: To provide historical background, information on ceramic tools, materials and processes and a series of beginners projects.

Source of Data: Survey of printed materials, catalogs and illustrative booklets; examination and evaluation of projects.

Findings and Conclusions: Ceramics are basic in modern society; historical background is interesting and helpful; ceramics develops originality and other qualities, and provides great personal satisfaction. Good teaching techniques are required.

816. **BLISS, KATHERINE S.** (M.A.). *Forty Years of Progress in the Electrical Industry and Corresponding Progress in Education Afforded by the Bliss Electrical School.* University of Maryland, 1935. 122 p.

A history, up to 1933, of the development of selected major devices utilizing electrical energy. The survey shows to some extent the necessity of correlating the course of study of a school with the advances and changes of the area being studied.

817. **BOHNSTORFF, WILLIAM K.** (M.S.). *History of Industrial Arts in the New Orleans Public Schools.* Louisiana State University, 1939. 50 p.

A review of the history of industrial arts in New Orleans from its introduction in 1907 to 1939.

818. **BOLLINGER, LEONARD F.** (M.A.). *An Industrial Arts Program for the Junior High Schools of Kenosha, Wisconsin.* Ohio State University, 1938. 111 p.

Traces the history of the industrial arts program in Kenosha, Wisconsin, evaluates the 1938 program, and suggests it be replaced by a Laboratory of Industries Program. Analysis of suggested program covers content, method, organization and administration, and physical setting.

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819. **BORRI, ROBERT** (Ed.D.). *The Organization, Content, and Teaching of General Industrial Arts in Selected American Secondary Schools.* Pennsylvania State College, 1942.

An historical study of the general industrial arts (general shop) movement. It considers the origin, philosophy, growth, and contributions of the general industrial arts program. Trends concerning the organization, content, and teaching of general industrial arts are included.

820. **BOURNE, WILLIAM A.** *World War II Veterans Training in Memphis Veterans Institute Operated by the Board of Education of the Memphis City Schools.* M.S., 1954, University of Tennessee. 91 p. Library, University of Tennessee, Knoxville.

Purpose: To examine and describe the veterans' training program of the Memphis Veterans Institute, January 1944 through June 1951.

Source of Data: Data were obtained from 2,619 veteran trainee records, and the files of Memphis Veterans Institute, Board of Education minutes and personnel records of the Memphis city schools.

Findings and Conclusions: Of the 1,543 white veterans enrolled, 1,273, or 82.5 per cent, completed the objective for which they were registered. Of 1,076 Negro veterans enrolled, 816, or 75.8 per cent completed training. A large per cent of those completing training found employment in the area for which they had trained. Many who discontinued training before completion found employment in the trade for which they had been trained. The large geographic area represented and the number completing training indicates that the program was effective.

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821. **BRASTED, F. KENNETH.** *A Study of the Extent, Nature, and Problems of the Relationships Between Industry and Education in Connecticut During the First Half of the Twentieth Century.* Ph. D., 1953, New York University. 275 p. Library, New York University, New York.*

Purpose: To identify and study the extent, nature and problems involved in the relationship between industry and education in the state of Connecticut since 1900, and to indicate those implications which may be of importance to industry and education in their future relationships.

Source of Data: Data were secured through a check list of forty-eight education-industry cooperative activities, a questionnaire using twenty-nine such activities, annual reports of the Secretary to the State Board of Education, minutes and correspondence files of trade associations, and interviews with educational and industrial leaders of the state.

Findings and Conclusions: No major specific problems in the relationships between industry and education in Connecticut were discovered. However, the greatest need was the establishment of a better two-way communication between the two groups. Industry had accepted a definite responsibility to assist education.

822. **BRAY MILLER M.** (M.S.). *Opportunities for Vocational Training in the Trades and Industries in Johnson City, Tennessee.* University of Tennessee, 1938. 73 p.

An historical development of industries and an occupational survey of trade and industries in Johnson City, Tennessee to indicate the need for additional vocational trade and industrial classes in the city. The study covers the period from 1923 with emphasis on the 1937–1938 period.

823. BREEDLOVE, FRED W. (M.S.). *The History and Operation of the Edward L. Hynes Pre-Vocational School in New Orleans.* Louisiana State University, 1939. 63 p.

A review of the history, purposes, and operation of the Hynes Pre-Vocational School, New Orleans, in 1939.

824. BROOKS, PAUL H. *The Effects of the Industrial Revolution on Industrial Education in America Between 1775–1875.* M. S., 1955, Kansas State Teachers College. 61 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To show the extent the Industrial Revolution has influenced early industrial education, and the social and economic conditions responsible for the changes in industrial education between 1775 and 1875.

Source of Data: Data were obtained from industrial education books, history books, and encyclopedias.

Findings and Conclusions: The report describes the early apprenticeship system and how it was finally destroyed, the different school substitutes for apprenticeship, the success and failure of these school movements, and the types of industrial education at the end of the period.

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825. BROWN, NATHAN. *A History of the Development of Education for the Apparel Industry in New York City.* Ph. D., 1954, New York University. 361 p. Library, New York University, New York.*

Purpose: To investigate a quarter century of cooperation between the apparel industry and public education in New York City.

Source of Data: Data were secured from the files of correspondence and documents of the Advisory Board for Vocational Education; the Central High School of Needle Trades; records of Max Meyer, Chairman of the Needlecraft Educational Commission; the minute book of the Educational Foundation for the apparel industry; and official documents of the Board of Education and the Board of Estimate of the city of New York.

Findings and Conclusions: The two major outcomes of the program described in this study were a new and model school building and a unique pattern of education on a junior college level.

826. BROWN, WALTER X. (Masters). *The History of the Teaching of Printing in the Chicago Public Schools.* Chicago Teachers College, 1943.

827. BUTLER, W. LIGON (M. S.). *A History and Summary of the Industrial Arts Department of Fort Worth, Texas.* A & M College of Texas, 1940. 162 p.

A history of the origin and development of the industrial arts program in Fort Worth, Texas public schools from 1882–1940.

828. CALVIN, LAURENCE V. (M. A.). *Major Trends and Influences in Industrial Arts Education in the United States from 1925 to 1935.* Ohio University, 1936. 96 p.

A study to find out in what way industrial arts is expanding or contracting and to determine the reasons for this change. The tendency toward more scientific curriculum construction, administration, teaching techniques, and evaluation is considered.

829. CARNEY, ALEX FORD. *Industrial Arts and Vocational Education Program in the Public Schools of Chattanooga, Tennessee for Negroes, 1940–1950.* M. S., 1951, Tennessee Agricultural and Industrial State University. 61 p. Library, Tennessee Agricultural and Industrial State University, Nashville.

Purpose: To examine development in the industrial arts and vocational programs in the public schools of Chattanooga from 1940 to 1950.

Source of Data: Data were obtained through questionnaires from parents, pupils, teachers, and industrial firms of Chattanooga, Tennessee, from records of the Chattanooga public schools and State Department of Vocational Education, and from interviews with teachers.

Findings and Conclusions: Industrial arts courses consisted largely of woodwork and mechanical drawing. One school had no provisions for industrial arts. Enrollments in homemaking were large for the entire ten-year period. Typing, auto mechanics, beauty culture, home economics, and shorthand were rated highest by parents, teachers, students, and industry. Bookkeeping, welding, mechanical drawing, diversified occupations, metal, and cabinet work were ranked lowest by these groups.

830. CARUTHERS, GUINN (M. Ed.). *The Development of Mechanical Drawing With Special Reference to the Austin, Texas, High School, 1896–1940.* University of Texas, 1940. 114 p.

A study of the development of mechanical drawing in the Austin, Texas high school, together with a follow-up study of students who took drawing. Curricula and textbooks, 1896 to 1940, are analyzed. Questionnaires were sent to 2,098 persons who graduated between the years 1934 to 1939.

831. CHENEY, MAX WILTON. *A Study of Industrial Arts in the Colleges of Florida.* M. A. in Ed., 1949, University of Florida. 160 p. Library, University of Florida, Gainesville.

Purpose: To trace the history of and present a current picture of industrial arts at Florida State University, Florida Agricultural and Mechanical College, and the University of Florida.

Source of Data: Most information was gathered from annual catalogues of institutions concerned. Conferences were held with department heads at each institution.

Findings and Conclusions: Throughout the history of industrial training at the three Florida institutions of higher learning, the curriculums have been designed to meet different needs. Florida Agricultural and Mechanical College has prepared Negro students for trades. Florida State University has trained young women in domestic activities. The University of Florida specialized in engineering and later developed an industrial arts teacher program.

832. CHESTER, L. GEORGE (M. S.). *A Survey of Negro Employment Trends in Evansville, Indiana.* Purdue University, 1948. 54 p.

A description of the trend of Negro employment from 1937 to 1947, based on interview and questionnaire data from ninety-five local employers.

833. COCHRANE, EARL A. *A Study of the Development of Evening and Night Schools Operating Under the State Board for Vocational Education in Texas.* M. S., 1950, North Texas State College. 43 p. Library, North Texas State College, Denton.

Purpose: To trace the growth and development of vocational education programs operating in the evening schools of the State of Texas, and to analyze some of the various types of evening school programs and facilities provided for conducting adult vocational evening schools.

Source of Data: Review of the annual reports of the Texas State Board for Vocational Education to the United States Office of Education, catalogues and bulletins of evening schools, bulletins published by the Texas State Board for Vocational Education, professional literature in vocational education and personal interviews with State Department of Education officials and others employed in the field.

Findings and Conclusions: It appears that the evening schools of the State of Texas are performing a valuable service for the industrial workers of the State. The close association between industry and evening schools during the war has brought about a better understanding of the need for trade preparatory and extension training. Teachers of evening schools should be persons trained as teachers as well as skilled tradesmen.

834. COLE, SHERMAN M. *A Brief History of Manual Training in the United States.* M. A., University of Minnesota, 1948. 73 p.

A documentary study of nineteenth century movements that laid the groundwork for the present program in industrial arts.

835. COLEMAN, JOHN W. *Calvin Milton Woodward's Contributions to Industrial Arts.* M. S., 1953, North Texas State College. 77 p. Library, North Texas State College, Denton.

Purpose: To review Calvin Milton Woodward's contribution to industrial arts.

Source of Data: Data were obtained from books, periodicals, and other unpublished material concerning the life, work and influences of Woodward.

Findings and Conclusions: The manual training program organized and put into operation by Woodward in the St. Louis Manual Training School did not reflect his true educational philosophy concerning the practical arts. Much of the prevailing philosophy of present-day industrial arts stems from Woodward's philosophy.

836. **COX, HOWARD LINDLEY.** *A History and Survey of La Cygne, Kansas, for Industrial Arts.* M. S., in Ind. Ed., Kansas State Teachers College, 1948. 76 p.

An historical sketch of La Cygne, Kansas, with a follow-up study of male high school students for the years 1926 to 1947.

837. **CROOM, EDWIN H.** *A History and an Analysis of J. B. Young High School, Madison County, Tennessee With References to Drop-Outs.* M. S., 1954, University of Tennessee. 92 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the history of J. B. Young High School and to give an account of the drop-outs for 1939 through 1952.

Source of Data: Data were secured through a questionnaire and from records in the county superintendent's office and the J. B. Young High School.

Findings and Conclusions: A total of 226 students dropped out over the thirteen year period. The largest percentage of drop-outs occurred in the ninth grade and declined each year thereafter. Many of the students who dropped out were employed or were in the armed forces. There is an apparent need for guidance especially in the ninth grade. Extensive industrial training is needed as well as evening trade extension classes.

838. **CROSSWRIGHT, EARL J.** (Masters). *Significant Developments in Industrial Education in Detroit Schools from 1931 to 1943.* Wayne University, 1945.

839. **CRUDDEN, PAUL BERNARD** (Masters). *The Development of Vocational Education in Massachusetts Since 1870.* Boston College, 1936.

840. **CRUMPTON, CHARLES REID** (M. S). *The History and Present Status of the Stair Technical High School, Knoxville.* University of Tennessee, 1940. 120 p.

A case study of the Stair Technical High School, including an analysis of the students of the school, from 1930 to 1937, in an effort to determine ages, why they entered the school, the type of trade training they took, and how they progressed on the job.

841. **CUNNINGHAM, FRANK KIENTZ.** *Auger Bits—Their Manufacture and Use.* M. A., 1951, The Ohio State University. 67 p. Library, The Ohio State University, Columbus.

Purpose: To compile the history of the auger bit, to describe its manufacture, and to acquaint the reader with the kinds of auger bits and their uses.

Source of Data: Data were secured from libraries, visits to and letters from auger bit manufacturers, and interviews with engineers.

Findings and Conclusions: The industrial arts program should provide opportunities for experimentation and manipulation of the auger bit and its related processes.

842. **CURRINDER, J. W.** (Masters). *Biographies of the Members of June 1916 Class in the Philadelphia Trade School.* University of Pennsylvania, c. 1935–47.

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843. **DALTON, FRANCIS WARREN.** *The Development of Industrial Education in Michigan.* Ph. D., University of Michigan, 1937. 228 p.

A brief résumé of the development of industrial education in the world with particular emphasis upon the development and progress of subsidized industrial education in Michigan. The principal aim throughout has been to bring together facts which appear to be significant without attempting to philosophize upon the effects of industrial education upon society.

844. **DANIELS, ARNOLD.** *The Development of Technical Education at Tennessee Agricultural and Industrial State University from 1912 to 1952.* M. S., 1953, Tennessee Agricultural and Industrial State University. 80 p. Library, Tennessee Agricutural and Industrial State University, Nashville.

Purpose: To present an account of federal and state legislation for technical education for Negroes in Tennessee, and to describe the growth and expansion of the School of Engineering at Tennessee A. and I. State University.

Source of Data: Documentated data were secured from state statutes, reports, school catalogues and bulletins, and materials issued by the U. S. Office of Education.

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Findings and Conclusions: The Mechanical Department was started when the institution was founded in 1912. The first offerings of a technical nature were in the form of manual training. The Mechanical Department offered courses in carpentry, bricklaying, blacksmithing, wheelwrighting, painting, shoemaking, plumbing, cabinet making, auto mechanics and mechanical drawing prior to 1925 both on the secondary and collegiate levels.

845. DAVIS, GLENDON SILAS. *The History of Lumbering and the Uses of Lumber in Industrial Arts Shops.* M. S., 1955, Oklahoma Agricultural and Mechanical College. 67 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To present a brief history of the lumbering industry in the United States, the development of machines used in the processing of lumber, and to classify the lumber used in industrial arts woodworking shops.

Source of Data: Data were obtained by use of a questionnaire, books, and brochures of lumber companies.

Findings and Conclusions: A study of the lumbering industry should be included in the industrial arts course. The industrial arts teacher should acquaint the students with the lumbering industry and the many occupations within the industry.

846. DAVIS, JOHN W. (M. S.) *History of Manual Training in the St. Louis Public Schools.* Iowa State College, 1938. 70 p.

A review of the development of manual training in the public schools of St. Louis, Missouri, from 1898 to 1937. Topics include objectives, content, financing, equipment, housing, and teacher personnel and administration.

847. DAVIS, LEONARD S. *Trends and Developments in Vocational Education.* M. Ed., 1948, Wayne University. 38 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To review the developments and trends in vocational education from its birth to the present.

Source of Data: Data were obtained from books and periodicals and Federal bulletins.

Findings and Conclusions: More consideration should be given to training for "families of occupations" than to training for a specific occupation. Adult education is increasingly needed in a population with an increasing average age. More education will be needed in the face of the increasing initial age of first full-time employment.

848. DAWSON, JULIAN MOORE. *An Historical Study of English Furniture.* M. S., 1954, North Texas State College. 71 p. Library, North Texas State College, Denton.

Purpose: To trace the development of selected pieces of furniture during five distinct periods; to ascertain changes in design and construction.

Source of Data: Data were obtained from books, periodicals, encyclopedias, and other literature concerning the history of furniture.

Findings and Conclusions: The design of English furniture produced during each of the five periods was influenced by the personal likes, dislikes, and ideas of the rulers of that country, rather than by such factors as abundance of material, ease of working, and durability.

849. DEAN, CHARLES THOMAS. *The Development of Trade and Industrial Education in Iowa from 1917.* M. S., 1948, Iowa State College. 79 p. Library Iowa State College, Ames.

Purpose: To study the growth and trends of the trade and industrial program in the State of Iowa, and to compare them with the other States in the Central Region.

Source of data: Historical research.

Findings and Conclusions: There was considerable growth in the trade and industrial program in Iowa during the 30 years covered by the study. This was especially noted after the last war and the program is still growing. The growth has been steady with the diversified occupations program coming into prominence. The greatest decrease was in the part-time continuation program which practically disappeared.

850. DEAN, JAMES M., *Jr.* *Development of Vocational Training in Pinellas County, Florida.* M. S., 1953, Kansas State Teachers College. 112 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To study the historical background and development of vocational education in Pinellas County, Florida, to show the need and direction for further growth.

Source of Data: Data were obtained from letters, histories, pamphlets, bulletins, school and local newspapers, school board records, school catalogs, school annuals, personal interviews, and questionnaires.

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Findings and Conclusions: Physical plant of the present vocational school should be enlarged and school raised to the Technical High School level. A guidance center should be established.

851. DeFORD, ALICE ROSALIE (M. Ed.). *Thirty Years of Industrial Arts.* Temple University, 1931. 32 p.

An analytical description of fifty-seven textbooks which were published between 1901 and 1930. The content, philosophy, position of the authors, and the authors' reasons for writing the books are considered.

852. DEL PILAR, LUIS. *Vocational Education: A Need for Puerto Rico.* M. Ed., 1953, University of Cincinnati. 70 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To describe the general economic and social conditions in the Island, to review the progress and organization of the educational system under American control and to show the need for and the organization of the kind of vocational education program necessary for the industrial and social development of the Island's people.

Source of Data: Data were secured through a series of research reports and interviews with educational leaders in Puerto Rico.

Findings and Conclusions: A need for vocational education as a means of raising living standards is apparent. Such vocational education must be correlated with the social and political conditions of the Island. Additional Federal support for school construction and salaries is needed. Additional curriculum provisions of cultural offerings proportionate to vocational offerings is indicated.

853. De PIETRO, JACK FRANCIS (Masters.) *Leaders in Industrial Arts.* Ohio State University, 1933.

854. DEPUY, GEORGE F. (Masters). *An Investigation of Trends in Industrial Arts which Have Occurred during the Period from 1914 to 1941.* University of Michigan, 1941.

855. DEWEBER, RALPH A. *Some Factors Related to Industrial Arts Teacher Education in Oklahoma.* M. S., 1954, Oklahoma Agricultural and Mechanical College. 45 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To present a brief history of each of the nine state institutions of higher learning, together with a description of the industrial arts staff and offerings of each.

Source of Data: Data were obtained through a questionnaire and from college catalogues.

Findings and Conclusions: A broad range of experience, both in teaching and the trade areas, was manifested by the staff members. Tenure for staff members in their present positions showed a broad range with a relatively high average for the group. Only a small number of present staff members hold less than a Master's degree. The courses offered vary considerably.

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856. DINGMAN, ERWIN. *A History of Vocational Guidance in Hesse, Germany, During the United States Occupation May 1945–1948.* Ph. D., 1949, New York University. 478 p. New York University Library, New York and Library of Congress.

Purpose: To determine whether a redirection of German vocational education and vocational guidance occurred in Hesse, during the period of the U. S. Occupation from May 1945 to January 1948; to indicate discernible changes during the Occupation; and to evaluate results.

Source of Data: Predominantly historical, comparative, documentary, and analytical. Direct and indirect observations used, strengthened by virtue of being in Hesse during Occupation and being in a key educational position. The Thesis is presented in two parts. Part I traces history of German vocational education from 50 B. C. to 1945 through the use of secondary sources and translations from the German. Part II is mainly developed from primary sources.

Findings and Conclusions: Identifies American and German agencies and persons charged with vocational guidance and vocational education. Defines the areas of education responsibility for the United States Military Government and for the appointed and elected German civil officials. Compares the aims and purposes of education and guidance as stated by the Military Government with those stated by the German civil government before and during the American Occupation. Traces changes in Military Government authority and policy in education as compared with changes in authority and policy which occurred in the German civil government. Studies Hessian response to Military Government directives. Traces trends and philosophies in German education and compares present philosophical concepts of education with those of the past. Studies enrollment figures and estimates in the various schools concerned with the vocational students. Analyzes the Hessian program for school reform in the light of the program visioned and prescribed by Military Government. Makes specific recommendations for developing democracy in Germany.

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857. DITZLER, WALTER E. *A Review of the Influences Bearing on the Development of Programs in Industrial Education.* Ph. D., 1953, University of Iowa. 323 p. Library, University of Iowa, Iowa City.

Purpose: To ascertain the influences bearing on the development of industrial education for 1857 to 1950, as shown in the Proceedings of the National Education Association.

Source of Data: Data were obtained by a historical survey of the papers, speeches and discussions included in the National Education Association Addresses and Proceedings.

Findings and Conclusions: In the period 1857–1875, there were few references to industrial education. Matters such as object teaching and the need for free universal education were preparing the way for industrial education. During 1876–1900, discussions were concerned with the Russian system. Much discussion of manual training for general education versus training for economic purposes appeared. Emphasis was placed on the need for modifying instruction to adjust to conditions brought about by the industrial revolution. The formal exercises of manual training began to be questioned and the need for training in special industrial programs was pointed out. Colleges began to use shopwork in training engineers. Dual purposes for manual training were developing, one for general education and the other for vocational-industrial education. In the period 1901–1929, much emphasis was placed on training for work in industry. The programs of vocational training increased in number. The general education values of manual training received little support. During 1930–1950, a program of industrial arts based on problem solving and exploratory experiences gained increasing recognition. The demand for trained workers fell off during the middle of this period but it increased rapidly during and after World War II.

858. DOLNITSKY, DAVID (Masters). *Development of Trends in the Industrial Arts.* University of Chicago, 1936.

859. DOUGHERTY, GRACE M. *Vocational Education in Minnesota.* M. A., University of Minnesota, 1942.

A detailed study of the development and present status of federally-aided vocational education in Minnesota, 1917 through 1939.

860. DUSTIN, CLIFTON H. (M. Ed.). *Industrial Education in New Hampshire: Its Development and Present Status.* Pennsylvania State College, 1935. 64 p.

Investigates all phases of education dealing with the development of industrial education in New Hampshire beginning in 1863 and extending through 1935. The need for a greater number of general shops in industrial arts programs is considered.

861. EDWARDS, GERTRUDE W. (M. S.). *The History of the Gerstmeyer Technical High School.* Indiana State Teachers College, 1937. 59 p.

A history of the Gerstmeyer Technical High School taken from minutes of the Board of School Trustees, newspapers, interviews, and bulletins, with a description of the problems encountered in establishing and operating a vocational school.

862. EGGEBROTEN, HAZEL HENRIETTA (M. A.). *Vocational Opportunities in Colorado.* University of Colorado, 1938. 110 p.

A study showing the vocational opportunities of Colorado, based on census reports and interviews. The study presents a historical background of Colorado before 1876.

863. ENSMAN, LEO M. *An Investigation on Trends in Industrial Education in Junior and Senior High Schools of Kansas Since 1944.* M. S., in Ind. Ed. 1940, Kansas State Teachers College. 74 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To determine the present status and recent trends in the field of industrial education in the State of Kansas.

Source of Data: Questionnaire to the administrators of the junior and senior high schools of the State with 69.5 per cent return.

Findings and Conclusions: Fifty-six of the urban senior high schools and 287 of the rural senior high schools offer industrial arts. The 3 most common industrial arts units were general woodwork, mechanical drawing, and the general composite shop. In the composite shop woodwork, bench metal, and mechanical drawing rank among the top units. The relation to the farm was stressed in making suggestions for industrial arts programs.

864. ERICKSON, ARDEN M. *A Study to Determine the Influence of Manual Training on Industrial Arts of Today.* M. S., 1950, North Texas State College. 113 p. Library, North Texas State College, Denton.

Purpose: To present a clearer picture of the background beginnings and principles of industrial arts, to show the beginnings of the philosophy of manual training and how the principles of manual training evolved out of that philosophy.

Source of Data: The origin of manual training in Europe and its introduction and development in the United States was outlined from historical sources. As a means of determining the manual training principles in effect in present high school industrial arts, a survey consisting of personal observations and personal letters was conducted.

Findings and Conclusions: The philosophy of manual training had its origin in such men as Rousseau, Pestalozzi, and Froebel who believed in work and practical application as a means of learning. Their ideas were further developed into a manual training program by such men as Cygnaeus of Finland, Otto Salomon in Sweden, and Alwin Pabst in Germany. The Swedish Sloyd system and the Russian system of manual training, along with their introduction and development in the United States, are also discussed. The survey indicated that the elements of the Swedish Sloyd system are predominant in industrial arts as it is taught in present day high schools.

865. ESPENDEZ-NAVARRO, JUAN (M. S.). *An Historic Development of Practical Arts and Vocational Education in the Island of Puerto Rico, 1898–1939.* Indiana University, 1940.

This study includes Federal and Insular legislation on vocational education, agricultural education, trade and industrial education, home economics, vocational rehabilitation, commercial education and distributive occupations, teacher-training, and the financing of a vocational program.

866. EVANS, HARRY LEO. *Mexican Silversmithing, A Study of Historical and Contemporary Contributions Pertinent to Industrial Arts.* Ed. D., 1953, University of Florida. 400 p. Library, University of Florida, Gainesville.

Purpose: To emphasize the relationship between the worth of the individual, the quality of craftsmanship, and the character of the civilization involved.

Source of Data: Data were obtained by experience in silversmithing, research in the Library of Congress, and study in Mexico.

Findings and Conclusions: If education is to be useful, there must be some working relationship between culture and skill. The most skillful and successful silversmiths are those who have interpreted their cultural heritage in such a manner as to make the past serve the future. Recommendations are made concerning the teaching of the silversmith's craft in industrial arts.

867. EVES, CHESTER EARL. *Early Industrial Arts in Fort Scott Public Schools.* M. S., in Ind. Ed., Kansas State Teachers College, 1941. 71 p.

An historical account of the introduction and development of industrial arts in the schools of Fort Scott, Kans.

868. FARLEY, CECILIA CAIN (M. A.). *History of Vocational Education in Baltimore since 1918.* University of Maryland, 1947. 53 p.

Official school documents were used to prepare this study of the major historical steps in the development of Baltimore's progress in vocational education. Only full-time, all-day, specialized schools were considered.

869. FARRAR, OTIS W. *Trends in Vocational Education in the Southern States.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 73 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To make a comparison of the provisions of the 5-year plans for vocational education in effect among the States for the period 1947–1952.

Source of Data: Data taken from State plans for vocational education.

Findings and Conclusions: There were many inconsistent variations with reference to the qualifications of personnel. The new State plans provide for a strengthening of the advisory committee for vocational education. There is a tendency in the new plans to reduce the number of clock hours required for the day school program. An important phase of vocational education is the out-of-school program. The new State plans provide for vocational guidance. The success of any vocational educational program is dependent upon the teacher responsible for teaching the class in the local school.

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870. **FEE, EDWARD MEREDITH** (Ph. D.). *The Origin and Growth of Vocational Industrial Education in Philadelphia to 1917.* University of Pennsylvania, 1938. 258 p.

An historical description of all forms of industrial education from the beginning of the colonization of Philadelphia to 1917. It is based on material from 122 manuscripts and 131 books and other publications.

871. **FESSARD, HENRY, C.** *Grinder Wheels: A Content Study of Wheel Manufacture, Care, and Use For Industrial Arts Orientation.* M. A., 1949, Ohio State University. 98 p. Education Library, Ohio State University, Columbus.

Purpose: The purpose of this study is: To present technical information concerning grinding wheels in language that secondary students in industrial arts can understand; and to search out the facts about grinding and to discover how this end was accomplished from the earliest times.

Source of Data: Historical research.

Findings and Conclusions: Technical significance: A necessity for explanation of the terms used in grinding wheel classification and the processes involved in wheel manufacture; knowledge of the elements of wheel classification; a knowledge of mounting and dressing operations; the theory of grinding; safety practice on grinding machines. Orientation implications: To aid students in achieving orientation with respect to abrasives, their characteristics and uses. Economic implications: The economic progress that grinding wheels have made possible through their use in industry, making refinement of mechanisms in industrial products possible. Cultural implication: The outstanding feature of American culture is the growth and development of its industrial aspect; grinding has contributed to this achievement by aiding manufacturing.

872. **FIELDS, EDWARD E.** *Survey of Opportunities for Vocational Education for Negroes in the Public Schools of Kansas City, Missouri.* M. S. in Ind. Ed., Kansas State Teachers College, 1947. 117 p.

An account of the development of industrial education for Negroes in Kansas City, Mo., together with an appraisal of same.

873. **FINK, EUGENE D.** (Masters). *History of the Development of Industrial Education and of Industrial Arts at the Oswego State Normal School.* New York University, 1933. 158 p.

874. **FONT, RAFAEL O.** (M. S.). *Improving Industrial Arts Education in Puerto Rico.* Pennsylvania State College, 1936. 99 p.

A brief history of Puerto Rico from the time of its discovery through 1936. Special emphasis is given the development of the educational system on the Island.

875. **FRANKLIN, LAIR.** *A Study of Industrial Arts Supply Finance.* M. A., 1950, Ohio State University. 60 p. Education Library, Ohio State University, Columbus.

Purpose: To reveal trends affecting aspects of supply in Negro schools of Louisiana, to determine the developmental stages of the industrial arts program, to propose corrective measures and to propose measures through which the program may be broadened.

Source of Data: Available sources of literature explored, including: library studies, personal letters, interviews and inquiries.

Findings and Conclusions: Thirteen items were included in the summary of the study including items related to: Definitions of supplies, management responsibilities, accounting systems, purchases, requisitions, apportioning methods, consumption and supervision.

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876. **FRANKLIN, MARION EDMUND.** *A History of Industrial Education Up to 1950.* Ed. D., 1952, University of Oklahoma. 372 p. Library, University of Oklahoma, Norman.

Purpose: To record the history of industrial education in Oklahoma.

Source of Data: Data were obtained from a historical survey of records and publications, contact with individuals having a major role in the development of the Industrial Education program in Oklahoma through personal letters and visitations, and the authors, experience in the field.

Findings and Conclusions: Little was accomplished in an organized program of industrial education until after the first decade of the twentieth century. During the next ten year period there was a rapid expansion of the manual training program in the high schools of the State. The introduction of vocational-industrial education at this time resulted in a period of approximately ten years of confused issues. Since that time there has been a rapid growth of these two parallel but differentialed programs.

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877. FREDERICK, LAWRENCE MONT. *Origin and Development of Industrial Education in New Mexico,* **Ed.D., 1955, University of Missouri. 267 p. Library, University of Missouri, Columbia.***

Purpose: To reveal the origin and trace the development of industrial education in New Mexico and to indicate the large amount of attention given to the several forms of industrial education in a state that is commonly considered to be agrarian in character.

Source of Data: Data were obtained from published and uunpublished reports of educational agencies of the New Mexico state government; books and theses compiled on New Mexican history; professional magazines published in New Mexico; bulletins and catalogs of various New Mexico educational institutions; 14 personal interviews; 93 letters from Chamber of Commerce and county and city school superintendents; and from 100 information forms from individual schools and industrial corporations.

Findings and Conclusions: It would appear that industrial education has played an extensive role in the over-all educational development of New Mexico. However, the quality of the total program probably would have been improved had there existed statewide supervision of both industrial arts and vocational-industrial education. The obstacle of financial inadequacy apparently has been a key factor in the development of industrial education in New Mexico.

878. GANTT, SAM MONTGOMERY. *A Study of the Influence of Certain Rulers of France and England on Furniture Design from 1300–1830.* **M.S., 1951, North Texas State College. 89 p. Library, North Texas State College, Denton.**

Purpose: To ascertain the influence of certain rulers of France and England on the design of furniture from 1300 to 1830 A. D.

Source of Data: Data were obtained from books, magazines, and encyclopedias.

Findings and Conclusions: Some of the rulers did influence the design of furniture. The personal likes and dislikes of the rulers were reflected through the design of the furniture.

879. GLASS, ORA FRANCIS (M.A.). *History of Industrial Arts Education in California.* **University of Southern California, 1931. 108 p.**

A history of industrial arts education in the United States and in California, with emphasis on its place in the curriculum in relation to the more vocational courses.

880. GLENN, FRANCIS BERKELY (M.S.). *The High School Program of Waynesboro, Virginia, in Reference to Community Needs.* **University of Tennessee, 1942. 102 p.**

An historical study of the development of Waynesboro High School from 1846 to 1941. It includes the results of a survey to determine the needs of business and industrial establishments and how they fit into the program of the high school.

881. GOGEL, KENNETH G. *The Industrial Museum and Industrial Arts.* **M.A., 1950, Ohio State University. 156 p. Education Library, Ohio State University, Columbus.**

Purpose: To trace the development of the industrial museums in Europe and the United States and to discuss their origin, purposes, collections, and educational features.

Source of Data: Interviews with curators within thes National Air Museum and the Department of Industries of the U. S. National Museum, Washington, D. C., and examination of literature listed in the bibliography.

Findings and Conclusions: Thirteen conclusions were presented concerning the following: Contributions of the study of inventions to our social culture; social and economic implications; curricula implications; bases for industrial expansion; contributions of industrial museums; handicaps of existing institutions; need for national museums.

882. GOURLEY, VINCENT CRAIG. *Historical beginnings of Machine Tools.* **M.A., University of Michigan, 1937. 76 p.**

A study of the development of the machines used in turning processes, primarily the drill and the lathe, in relation to the religious, artistic, cultural, and social life of peoples from earliest times to the present.

883. GRAY, QUINTON LAFAYETTE. *The Development of Industrial Arts in the Negro Public Schools of Nashville, Tennessee.* **M. S. 1954. Ten-**

nessee Agricultural and Industrial State University. 64 p. Library, Tennessee Agricultural and Industrial State University, Nashville.

Purpose: To trace the development of industrial arts in the Negro Public Schools of Nashville, Tennessee.

Source of Data: Data were collected from memoirs, diaries, interviews, reports, letters, and public documents in possession of teachers and principals of Negro public schools, from the central office of the Board of Education, and from officials of civic organizations.

Findings and Conclusions: Industrial arts was introduced in the Negro public schools of Nashville, Tennessee in 1907. The growth and development of the program has been continuous since its inception. All of the public secondary schools for Negroes in Nashville now offer industrial arts.

884. GREENBAUM, LEONARD. *The History and Development of the Future Craftsmen of America.* M. Ed., 1955, Wayne University. 57 p. Department of Industrial Education, Wayne University, Detroit.

Purpose: To compile a report which should be of assistance in reactivating the Future Craftsmen of America or in forming another such organization.

Source of Data: Data were obtained from published materials of various organizations, the records of the Future Craftsmen of America, and interviews with a number of national Future Craftsmen of America officers and leaders.

Findings and Conclusions: The Future Craftsmen of America organization was formed to coördinate the work of local industrial arts clubs throughout the country. The organization ran into trouble because of the economic, political, and social pressures that were placed on the leadership and on the local club sponsors by organized labor, which had been left out of the organization movement. The strength of the organization was the inherent educational values derived from the activities of the individual clubs.

885. GRETA, FRED O., *Jr.* *The Purposes of Industrial Arts Education.* M. S. 1949, Stanford University. 70 p. Cubberley Library, Stanford University, Palo Alto, Calif.

Purpose: To determine: The early purposes of industrial education. How the purposes have changed from the past to the present. What have been the causes for the changes that have taken place in industrial education; whether the industrial arts education program is adequate for present day needs.

Source of Data: The method used in making the study was to review the purposes of school shop work in an historical manner, in an attempt to determine reasons for changes in these purposes.

Findings and Conclusions: The study shows that there appears to be a move to re-emphasize the manual side of industrial arts rather than the informational side. There seems to be a trend especially in smaller schools toward the use of the general shop rather than the separate-subject or unit-shop.

886. GROARK, ESTHER MARGARET (Masters). *A History of Vocational Education in the Philadelphia Public School System.* Marywood College, 1932. 58 p.

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887. HALL, CLYDE WOODROW. *A Survey of Industrial Education for Negroes in the United States Up to 1917.* Ed. D., 1953, Bradley University. 275 p. Library, Bradley University, Peoria, Illinois.*

Purpose: To compile, interpret, and present information concerning industrial education for Negroes in the United States prior to 1917.

Source of Data: Data were obtained from catalogues, bulletins, proceedings, books, magazines, and reports.

Findings and Conclusions: This study reveals the nature of industrial education offered Negroes during slavery and the period between the Civil War and the passage of the Smith-Hughes Act. Negro slaves received industrial training before the Civil War through apprenticeship programs operated by the plantation or settlement. Manual labor schools for free Negroes were started in the North between 1830 and 1860 to counteract the refusal of skilled mechanics to apprentice Negroes. Tuskegee Normal and Industrial Institute and Hampton Normal and Agricultural Institute were the largest industrial schools for Negroes prior to 1917.

888. HALLIDAY, WILLIAM G. *Swedish Educational Sloyd and Its Contribution to Industrial Arts Education.* M.S. in Ind. Ed., 1949, Kansas State Teachers College. 73 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To make a study of the history of the development of the Naas System of Educational Sloyd, the social and economic conditions responsible for its development, and the extent to which its method and principles influenced industrial arts education.

Source of Data: Analysis of pertinent literature with letters from the Director of Naas.

Findings and Conclusions: The social economic conditions produced "husslojd," the basis for all handwork instruction in the country. Otto Salomon developed a system of handwork instruction based on educational principles, to develop children mentally, morally, and physically. His method used a series of models incorporating the introduction of handwork exercises in a definite sequence. Sloyd in America was modified in many ways to meet varying conditions and eventually became so intermingled with other systems as to make it difficult to recognize any semblance of the original system.

889. HAMILL, ROBERT (M.S.). *A Survery of Vocational Education in the City of Portland, Oregon.* School of Education, University of Oregon, 1934. 73 p.

A history of the growth of vocational training in Portland public and private schools from 1904 to 1934. Included are such topics as objectives of programs, methods of financing, public support and attitudes, courses of study, and recommendations for improvement.

890. HANKAMMER, OTTO ALFRED (M.A.). *Content of High School Drawing.* Ohio State University, 1930.

An historical sketch of the early content and development of high school drawing in an effort to determine the nature of the subject and to suggest methods for improvements.

891. HARDELL, E. P. (Masters). *A History and Development of Practical Arts in McKinley High School.* University of Maryland, 1938.

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892. HARRISON, OVAL STANLEY (Ed.D.). *The Development of Industrial Education in Missouri.* University of Missouri, 1940. 330 p.

Presents historical data concerning the development of industrial education in Missouri since the middle of the nineteenth century to 1940. A brief summary of the development of industrial education in the United States is included.

893. HARTEL, PAUL. *History of the Iowa Industrial Education Association.* M.S., 1953, Iowa State College. 90 p. Library, Iowa State College, Ames.

Purpose: To present pertinent information related to the history of the Iowa Industrial Education Association.

Source of Data: Data were obtained from interviews with previous members, excerpts and citations from periodicals, minutes and programs of the meetings, and miscellaneous materials supplied by former presidents.

Findings and Conclusions: The association had its beginning in 1908 in the Iowa Manual Arts Association. This was followed in 1921 by the Iowa Association of Industrial and Manual Arts Teachers. This same year the name was changed to the Iowa Industrial Arts Association. In 1944 the organization changed its name to its present terminology. A complete description of the activity of the organization from 1908–1952 is included in the study.

891. HARTMANN, EMILY S. (M.S.). *A Survey of the Vocational Schools in the State of Wisconsin.* University of Southern California, 1936. 210 p.

An outline of the history and development of the vocational idea in the schools of Wisconsin. The study shows that the investment is sound in terms of the outcomes of vocational education.

895. HARTRICK, GUY T. (M.S.). *The History of Industrial Arts in the Secondary Schools of Missouri.* University of Southern California, 1936. 107 p.

A review of facts bearing directly and indirectly upon the history of industrial arts in the secondary schools of Missouri.

896. HARWELL, ELMER PITNEY (M. A.). *The History of the Development of Practical Arts in McKinley High School. (Washington, D. C.).* University of Maryland, 1938. 139 p.

An historical approach to the practical arts courses in McKinley High School in Washington, D. C.

897. HATHAWAY, CARL C. (M. S.). *Suggestions for Arts and Crafts Courses in the Elementary School.* East Texas State Teachers College, 1948. 105 p.

A study tracing the development of the arts and crafts movement from its beginning to the date of the study, showing how crafts originated, were developed, and now exist. It also illustrates the influence which arts and crafts have had upon manual training. It furnishes a fairly comprehensive picture of the possibilities of crafts, discussing the merits of the various crafts and their possible contribution to the school program.

898. **HAUSER, JOHN C.** ***The Inception and Development of Contemporary Furniture Design.*** **M. A., 1953, Colorado State College of Education. 129 p. Library, Colorado State College of Education, Greeley.**

Purpose: **To trace the development and socio-economic influences on contemporary furniture design.**

Source of Data: **Data were obtained from books, magazine articles, and other reference material.**

Findings and Conclusions: **Furniture is being judged today by its usefulness and not by its decorative quality. Modern or contemporary furniture accounts for 40 per cent of furniture sales. Contemporary furniture seems to have won its rightful place in our present day living.**

899. **HAWKE, JERRY R. (M. S.).** ***Three Years of Vocational Industrial Education in Haiti*** **Pennsylvania State College, 1930. 136 p.**

A history of the development of vocational education of Haiti for the period 1925 to 1928. It includes a summary of the racial, political, and industrial background preceding the occupation of the island by United States military forces in 1915.

900. **HAWLEY, WILLIAM B. (M. A.).** ***The Development of Vocational Education in Michigan During the Period 1940–1947.*** **Wayne University, 1947. 109 p.**

An investigation and analysis of the sequence of events which led to a change in the philosophy and in the supervision of the administration of vocational education in Michigan from 1940–1947.

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901. **HEJKAL, OTTO CHARLES.** ***Life and Work of Robert W. Selvidge.*** **Ed. D., 1950, University of Missouri. 396 p. Library, University of Missouri, Columbia.**

Purpose: **To trace the life of Robert W. Selvidge and his contributions and influence on industrial education in America.**

Source of Data: **A study was made of pertinent industrial education periodicals, minutes and proceedings of committees and organizations, and of Professor Selvidge's letters and writings. Interviews were held and letters or an information form were sent to professional and business organizations, friends, associates, and former students.**

Findings and Conclusions: **Robert W. Selvidge as a teacher had the ability to inspire, encourage, and to challenge his students as few men can. He especially emphasized student participation in problem solving and job planning as important aspects of learning. He was a leader and active participant in most local, regional and national organizations promoting industrial education. In these organization meetings, and in his many books, magazine articles, and speeches he presented his philosophy of industrial education, his techniques of analysis, his methods of selecting and organizing subject matter, his individual instruction sheets, and his seven-step plan for teaching industrial arts and vocational industrial subjects. These ideas, policies and techniques have influenced the teaching of industrial education throughout the nation, and their evidence is apparent in current publications and school practice.**

902. **HILES, RAYMOND L. (M. Ed.).** ***The Development of Vocational Training in Diversified Occupations in Texas High Schools from 1931 to 1937.*** **University of Texas, 1938. 95 p.**

A review of the development of the diversified occupations programs in Texas. The programs in twenty-one school systems in Texas are compared.

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903. **HILL, JAMES LEVAN.** ***A Study of the Various Aspects of Industrial Arts as Influenced by the Changing Conditions of Our American Civilization from 1880 to 1950.*** **Ed. D., 1953, The Pennsylvania State University. 275 p. Library, The Pennsylvania State University, University Park.**

Purpose: **To show the relationship between various changing aspects of the American culture, educational psychology, education, and industrial arts from 1880 to 1950.**

Source of Data: **Data were secured by the historical method of research.**

Findings and Conclusions: As industrial arts became a part of the curriculum of the public schools, its purpose changed with the changing philosophy of education. Industrial arts content, method and organization have changed as a result of experimentation in the nature of the learner, and the learning powers. Industrial arts is continuously submitting its total program to critical examination and analysis. This is in the form of a critical evaluation of purpose; and an analysis of the purpose into specific contributions that industrial arts can make, behavior changes to be expected in youth, or educational outcomes to be achieved. All facets of society, educational philosophy and practice, and the nature of the learner and how he learns are contributing to this analysis.

904. **HILL, J. R.** *The Comparison of the History of Industrial Education in England, France, Germany, Russia and the United States.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 101 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To compare the history of industrial education in England, France, Germany, Russia, and the United States.

Source of Data: A survey of literature was made to ascertain the significant events and their dates in the development of industrial education in the countries listed.

Findings and Conclusions: A study of the history of industrial education in England, France, Germany, Russia and the United States reveals that its development in these countries has been related to significant dates and to leaders in the field.

905. **HOFFER, CARL GEORGE.** *Survey of Industrial Arts in Holmes, Wayne and Stark Counties.* M. A., Kent State University, 1941. 89 p.

Industrial arts was surveyed in Holmes, Wayne and Stark counties (Ohio) as to value, organization, and effectiveness. Period covered was approximately 1850–1940.

906. **HOOVER, THOMAS W.** (Masters). *A Review of the History of Vocational Rehabilitation in the United States Since 1900.* Wayne University, 1943.

907. **HOUSE, ORAN J.** (M. A.). *The Organization of Industrial Arts Courses for the Southern State Normal School, Springfield, South Dakota.* University of South Dakota, 1938, 80 p.

A study of the present and past status of industrial arts courses in the Southern State Normal School and its ability to meet the educational needs of that region in respect to agriculture and the maintenance and repair of agricultural equipment.

908. **HUGHES, ROBERT J.** (Masters). *Recent Trends in Industrial Arts Education in California.* Stanford University, 1942.

909. **HUGHES, WILLIAM EDWIN.** *A History of the Kentucky State Industrial Arts Association.* M. Ed., 1954, University of Louisville. 59 p. Library, University of Louisville, Louisville, Ky.

Purpose: To give an historical account of the Kentucky State Industrial Arts Association, its organization, work, and purposes.

Source of Data: Data were secured from minutes of annual meetings and newsletters of the Kentucky State Industrial Arts Association, and interview.

Findings and Conclusions: Membership in the Kentucky State Industrial Arts Association has increased at a greater rate than the increase in the number of industrial arts teachers in the state.

910. **HULSEY, HARRY W.** *Jr. The Evolving House with Reference to Industrial Arts Instruction.* M.A.E., 1954, University of Florida. 143 p. Library, University of Florida, Gainesville.

Purpose: To trace the development of better housing in America, and to show its implications for industrial arts instruction.

Source of Data: Data were secured from books, articles, and experience as a building contractor.

Findings and Conclusions: The problems of housing deserve more emphasis in the public school curriculum.

911. **IVERSON, HERBERT.** *Changes in the Industrial Education and Industrial Arts and Vocational Education Magazines Through Ten Years.* M.A., University of Minnesota, 1936. 57 p.

A comparative study of two professional journals in industrial education over a 10-year period.

912. JACKSON, EUGENE G. *History and Development of Automotive Instruction in the School Shops in Kansas.* M.S., 1955, Kansas State Teachers College. 49 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To trace the origin and development of automotive training in school shops in the State of Kansas.

Source of Data: Data were obtained from a questionnaire, from interviews, and from automobile registration in Bourbon, Crawford, and Labette counties from 1914 to 1928.

Findings and conclusions: The earliest courses containing "auto mechanics" instruction were found to be college courses in Farm Mechanics, Physics, Mechanical Engineering, Steam and Gas Engineering. Organized auto mechanics courses were introduced in a secondary school in 1917. About 27 Kansas counties are currently offering automotive courses, while some 78 counties have not yet adopted such courses.

913. JARED, CLIFFORD HASKILL. *A Comprehensive Study of the Origin and Uses of Glues.* M.S., 1951, Oklahoma Agricultural and Mechanical College. 64 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile information on the origin, types, and uses of glues.

Source of Data: Data were obtained from books, publications of glue manufacturers and distributors, the United States Government Printing Office, and the Forest Products Laboratory, Madison, Wisconsin.

Findings and Conclusions: The report contains information commonly omitted from woodworking textbooks.

914. JEWELL, HAROLD CLINTON. *The Development of Industrial Arts in the United States.* M.A., 1953, Middle Tennessee State College. 62 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To trace the chronological development of industrial arts in the United States for the purpose of securing a better understanding of the present industrial arts program and its importance in the education of youth.

Source of Data: Data were secured from writings on industrial arts.

Findings and Conclusions: Industrial arts should begin in the lowest grades and continue through high school. All persons can profit from the study of industrial arts. Industrial arts as a program of instruction has tended to develop with the progress of industry.

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915. JOCHEN, ALBERT EDWARD. *The History and Development of State- and Federally-Aided Day Trade and Industrial Schools in New Jersey From Their Inception to 1943.* Ed. D., Rutgers University, 1947. 369 p.

Historical study of State- and Federally-aided day trade and industrial education in New Jersey from its inception to 1943. Presents a good educational picture of the history, development, and organization of the State Education Department, Vocational Division, and all county and city systems of trade and industrial education in New Jersey. Significant trends, developments, and implications are also included.

916. JOHNS, RICHARD JAMES (M.Ed.). *Origin and Development of Technical Education in Canada.* Colorado Agricultural & Mechanical College, 1941. 131 p.

A review of the origin and development of technical education in Canada. The economic, social, and educational forces that influenced education from the time of the eighties to the time of the War Training Program are discussed.

917. JOHNSON, CHARLES E. *Certain Trends in Industrial Arts Shop Planning 1930 to 1950.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 66 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To investigate the trends in industrial arts shop planning during the past 20 years.

Source of Data: A systematic examination of books, periodical articles, unpublished materials, and State industrial arts handbooks.

Findings and Conclusions: More cooperation among architects, administrators and shop instructors in the planning of shops. A greater dependence upon artificial lighting, better decoration, and more advantageous location for the school shop is noted. A trend toward the general shop, increased size of shops, and avoidance of irregular shaped shops. Display cases and air conditioning systems are coming into greater use. The report contains a comprehensive check list useful for those concerned with the problem of shop planning.

918. **JOHNSON, F. MORRIS (M. A.).** *A History of the Industrial Arts of Colorado State College of Education, 1891–1942.* Colorado State College of Education, 1942. 105 p.

A history of the industrial arts department at Colorado State College of Education from its beginning to 1942.

919. **JOHNSON, THOMAS BURNETT.** *The Evolution of Certain Common Hand Tools Used in Woodwork.* M. S., 1953, North Texas State College. 157 p. Library, North Texas State College, Denton.

Purpose: To present in narrative form an account of the evolution of hand tools employed in woodwork.

Source of Data: Data were secured from books. The historical method of study was used.

Findings and Conclusions: Virtually all of the more frequently used tools have developed from the shaped stone of ancient man, known as the Celt. Many of the vitally significant changes in hand tools were brought about by unknown inventors whose names were not recorded.

920. **JONES, EARL W. (M. S.).** *Trends in Industrial Arts Education Based on Analysis of Periodical Literature from 1920 to 1934.* Iowa State College, 1934. 88 p.

A study of magazine articles pertaining to industrial arts to find out which phase of industrial arts had the largest coverage per column inch.

921. **JUSTICE, ARTHUR W.** *A General Study of Lubricants.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 63 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile a brief history of lubricants and the petroleum industry, and to formulate principles for the selection and application of lubricants.

Source of Data: Data were obtained from publications of oil companies and machine manufacturers and books in the college library.

Findings and Conclusions: There is an abundance of information on lubricants but most of it is of a technical nature and not clearly interpreted by the average person. Some information of this type should be included in school shop textbooks and the school curriculum.

922. **KASSAY, JOHN ANTHONY.** *Historical Development of the Lathe.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 106 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To trace briefly the evolution of a machine-tool, the lathe, by major mechanical principles, from its prehistoric problematic origin up to the year 1950.

Source of Data: Documentary study from some of the earrliest books dealing with tools and their description to current literature including manufacturers' treatises. Verification of points by direct correspondence.

Findings and Conclusions: The lathe apparently had its inception in the principles of perforating material. Some conclude that it was the outgrowth of the potter's wheel. The modern lathe was born when Mandslay added the principle of the slide-rest. The development of the turret lathe made the "American system" of manufacture possible. Screw machines were a natural outgrowth of the turret lathe. High speed cutting tools increased speeds and production with a consistent lowering of costs per unit. Application of electronics to lathes will probably bring revolutionary changes in machine tool operation and production methods.

923. **KEMP, HILLES GLENN.** *Automotive Transportation in the United States, 1893–1950,* M.A., 1951, The Ohio State University. 113 p. Library, The Ohio State, University, Columbus.

Purpose: To trace the development of the automotive industry in the United States, with special reference to curricular implications for industrial arts.

Source of Data: Data were obtained from publications and from the automotive industry, previous research in the area, driver education programs, and field trips to the transportation area of the national museum.

Finding and Conclusions: The automotive industry accounts for directly or indirectly the employment of 6,500,000 people. It is the largest consumer of many U. S. industrial products such as crude rubber, plate glass, steel, gasoline, leather, copper, tin, zinc., and cotton. It affects mobility, world trade, mass-production and recreation.

924. **KENNEDY, BERNARD.** *The Development of Industrial Arts in the Public Schools of Grand Rapids, Michigan.* M.A., 1949, University of Michigan. 83 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To present the history and development of industrial arts education in the public schools of Grand Rapids and to evaluate to some degree its achievement and trends.

Source of Data: The Board of Education Proceedings were used as an aid in tracing the history and development of industrial education in Grand Rapids. In addition, the Grand Rapids School Survey, made by the Committee on Field Service, Department of Education, University of Chicago, was used.

Findings and Conclusions: The first manual training courses were offered in the grade schools in 1900–01, and consisted of knifework, shop work, cooking and sewing. Four years later, manual training was introduced in the high school, and there has been an increase in the offerings of courses varying with the needs of the times. This development reflected the philosophies of education prevalent at the times, and the attitudes toward education in general. The data shows that the industrial arts program presently offered in the public schools of Grand Rapids is a rather complete and effective one. Upon the strength of the Chicago University Survey, the author was able to make recommendations which, if followed, would make the program even more effective and complete. In addition, a specific plan for course presentation was proposed and will be taken under advisement by the public school administration.

925. **KIDDER, RUSSELL B. (M.S.).** *A Review of the General Shop Movement in Industrial Arts Education.* Oregon State College, 1933. 99 p.

A review of the development of the general shop in the United States. Objectives are outlined, and related information for setting up a general shop program is included.

926. **KINGZETT, ANNIE L.** *Handcraft as Part of the Activity Program.* M.A., Kent State University, 1942. 92 p.

A study of handicrafts from the time of early settlers up to the present use of handicrafts in education.

927. **KIRKMAN, OTIS CLIFFORD (M.S.).** *A Study of Industrial Arts and Vocational Education with Applications to Chattanooga, Tennessee.* University of Tennessee, 1935. 153 p.

An historical study of industrial arts and vocational education in the United States. Emphasis is on the development of industrial arts and vocational education in Chattanooga, Tennessee, with consideration given to dropouts and their causes for the purpose of improving the program.

928. **KLOPFENSTEIN, CHRIS JOSEPH.** *The History of Industrial Arts in the Battle Creek Public Schools.* M.A., University of Michigan, 1943. 53 p.

A history of the development of industrial arts in Battle Creek, Mich.

929. **KNOX, HOWARD L. (M.A.).** *Planography.* Ohio State University, 1937. 364 p.

An historical study of the processes and industrial methods of planography in an effort to point up a means of introducing it into industrial arts and industrial vocational programs.

930. **KRUEGER, ALBERT T. (M.S.).** *A Study of Trade and Industrial Education in Texas, Since Its Inception.* A & M College of Texas, 1939. 70 p.

A description and analysis of the program of trade and industrial education operated in Texas under federal and state laws up to 1939

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931. **KRUMBIEGEL, WALTER OTTO.** *A History of Recent Developments in the Activity Movement in the United States, 1900–1950.* Ph.D., 1955, New York University. 424 p. Library, New York University, New York.*

Purpose: To record developments in the activity movement in elementary education in the United States and to relate developments to the social developments of the twentieth century.

Source of Data: The historical method was employed in this study. Reports of educational theory, practice, and experimentation bearing on the growth of activity education and the activity movement were analyzed and related to the milieu.

Findings and Conclusions: The activity movement represented an attempt to replace the traditional subject matter curriculum of the elementary school with a curriculum consisting of activities, units, experiences, themes, or centers of interest. Evidence indicated that activity education could be traced to primitive cultures. The activity movement of the twentieth century in the United States, however, stemmed from William H. Kilpatrick's project method. The data supported the view that the activity movement reflected the social developments of the twentieth century to some degree. Although educators seemed to agree on the value of including activities in the curriculum, they disagreed on the use of those activities. Some educators held that activities should be employed to teach subject matter while others contended that subject matter should be taught as called for by the activity. Experimental evidence favored the activity curriculum over the traditional curriculum. The status of the activity movement at mid-century was not clear.

932. LARSEN, EDWARD C. (M.A.). ***Past Development, Present Status, and Operation of Trade and Industrial Education in the State of Utah.*** **University of Utah, 1948. 141 p.**

A review of trade and industrial education in Utah from 1862 to 1948. The effects of vocational acts are stressed, and the current program and plans for expansion are treated.

933. LAWRENCE, BILLIE R. ***An Historical Study of the Use of Wood and the Kinds of Wood Used in the Construction of Implements, Furniture, and Buildings.*** **M.S., 1953, North Texas State College. 102 p. Library, North Texas State College, Denton.**

Purpose: To compile information on wood and the use of wood in the construction of weapons, tools, private dwellings, public buildings, and furniture.

Source of Data: Date were secured from books and bulletins.

Findings and Conclusions: There has been little decline in the use of wood for furniture construction, considerable decline in the use of wood for buildings, and still a greater decline in the use of wood for construction of implements.

934. LEWIS, JOSEPH L. ***A Study of the Craft Guilds of the European Middle Ages and Their Contribution to Industrial Arts Education.*** **M. S., 1950, North Texas State College. 197 p. Library, North Texas State College, Denton.**

Purpose: To trace the development of the craft guilds and to disclose factors affecting modern industrial arts.

Source of Data: Data were obtained from books dealing with history of the guilds, from histories of the middle ages and from recent magazines and newspaper articles.

Findings and Conclusions: Under present conditions, the best industrial preparation for the years ahead must provide a balance between special and general abilities, economic and social living. Industrial arts education, patterned after apprenticeship principles, may be regarded as an important and vital part of the present day effort to produce skilled and versatile workmen, and at the same time to provide for the social, moral, and physical needs of all members of an industrial society.

935. LOCKARD, TILMAN McKINLEY (M. A.). ***Calvin Milton Woodward, A Biography with Special Reference to His pioneering Efforts On Behalf of Manual Training.*** **Ohio State University, 1939. 218 p.**

A biographical sketch of Calvin M. Woodward in an effort to point up the significance of his work toward the development of the industrial arts program. The improvements he made in industrial arts teaching techniques are emphasized.

936. LOCKERBY, JAY D. ***Federally Aided Vocational Education in the State of Wisconsin.*** **M. A., University of Minnesota, 1947.**

A summary of the development of vocational education in Wisconsin and the United States.

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937. LOUGHLIN, RICHARD LAWRENCE. ***An Historical Study of Convalescent Reconditioning and Rehabilitation in United States Army Hospitals.*** **Ph. D., 1948, New York University. 328 p. Library, New York University, New York, and Library of Congress.**

Purpose: To trace the various aspects of the convalescent reconditioning program in the United States Army Service Forces Hospitals back to their initial appearance in the annals of military medicine in this country; and, to discover the relationship between convalescent reconditioning and rehabilitation activities in the United States Army Hospitals prior to World War II, and the convalescent reconditioning programs in the United States Army Service Forces Hospitals during World War II.

Source of Data: Analysis of pertinent official documents such as: War Department Technical Manuals, Armed Service Forces Circulars, and other Army Service sources. Numerous civilian publications on rehabilitation and reconditioning, personal interviews, investigations, and field trips are utilized on a procedural basis for the collection of data and resultant interpretation.

Findings and Conclusions: Various aspects of the reconditioning program of World War II made their initial appearance in the annals of military medicine of World War I. A letter from the President made a policy shift during World War II to a more successful return of the recuperative to civilian life. Subjective evidence supports the belief that military training within the convalescent reconditioning program is good in all areas of return. "Commercial Therapy" in Army hospitals, despite its psychology and vocational values, has several drawbacks not to be found in industrial or work therapy with prescribed occupational therapy. Physical reconditioning shortened the period of convalescence, educational retraining fell short of its goal, and occupational therapy established itself as an essential element of medical-military convalescent care in World War II. The claims of convalescent reconditioning as an effective therapeutic adjunct to routine medical treatment cannot be sustained by scientific verification because of lack of acceptable statistical data. Although pensions and cash bonuses were awarded to United States GI's as early as 1636 (sic) no medico-military program for reconditioning and rehabilitating convalescent soldiers was evoked until World War I.

938. LUSK, WARD WEBSTER (M. S.). *The Growth of Trade and Industrial Education in California.* University of Southern California, 1935. 129 p.

A study of the development of trade and industrial education in California under the Smith-Hughes Act. It recommends expansion of adult facilities and the extension of reimbursement to college-grade classes.

939. MANGUM, CARY PETER (M. A.). *The South's Industrial Development and the Industrial Educational Program.* George Peabody College, 1931. 95 p.

A comprehensive study of the industrial resources of the South which points out that our industrial education and industrial arts education program should connect the educational program to the industrial needs of the people.

940. MARIHART, EARL E. *History of Adult Evening Schools at Dubuque, Iowa.* M.S., 1951, Iowa State College. 181 p. Library, Iowa State College, Ames.

Purpose: To trace the history of the adult evening program in Dubuque, Iowa.

Source of Data: Data were obtained from the files of the county court house, the city of Dubuque, the Board of Education, the official evening school records, and miscellaneous letters, newspapers and scrapbooks.

Findings and Conclusions: Prior to 1913 the classes offered were held in various buildings in the city. Following that date, the Board of Education assumed responsibility for adult classes. In 1926 the evening school expanded its facilities to offer any class that had an enrollment of 15 or more.

941. MARSHALL, EARL J. (M.S.). *The Evolution of Industrial Arts in Ohio.* Ohio State University, 1941. 115 p.

This study traces the progress of industrial arts courses in the schools of Ohio since the beginning in 1883 to 1940. The various stages of change are pointed out and the aims and objectives during each of these stages are indicated.

942. MARTIN, A. M. (Masters). *A Study of the Origin and Early Development of Mechanical Drawing.* University of Pennsylvania, c. 1935–47.

943. MARTIN, HUDSON S. (M.A.). *The Development of Industrial Education in Youngstown, Ohio.* University of Pittsburgh, 1936. 136 p.

A history of the development of industrial education in Youngstown, Ohio, from 1785 to 1936.

944. MATTHEWS, LUDIE OAKS. *A Study of the History of Federal Legislation Concerning Vocational Education and the Growth of Vocational Education in the Secondary Schools of Texas from 1918 to 1948.* M.S., 1950, North Texas State College. 116 p. Library, North Texas State College, Denton.

Purpose: To trace the history of Federal laws concerning vocational education and the growth of vocational education in the secondary schools of Texas from 1918 to 1948.

Source of Data: Data for the study were secured from bulletins, pamphlets, the Annual Reports of the Federal Board for Vocational Education from 1918 to 1933, and Digest of Annual Reports of State Boards for Vocational Education from 1934 to 1948.

Findings and Conclusions: Vocational education increased steadily in the schools of Texas from 1918 to 1944. Agriculture employed the largest number of teachers each year until 1946, when vocational home economics took the lead. Enrollment in all the fields of vocational education has been continuous and steady from 1918 to 1949. Home Economics had a larger enrollment than vocational agriculture for 20 of the 30 years. Vocational agriculture received more money than trade and industrial education and vocational home economics combined. Since 1940, Texas has received more money for vocational education each year than any other State.

945. MATTHEWS, WAYNE. ***The Growth of Industrial Arts in the Secondary Schools of Texas from 1927 to 1948.*** **M.S., 1949, North Texas State College. 68 p. Library, North Texas State College, Denton.**

Purpose: To trace the growth of industrial arts in the secondary schools of Texas from 1927 to 1948.

Source of Data: Data for the study were taken from books, magazines, bulletins published by the State Department of Education of Texas, and other theses treating the subject up to the year of 1927.

Findings and Conclusions: The growth in each of the industrial arts subject was rather consistent throughout the 21 years. The depression period and World War II affected the growth of all industrial arts courses except drawing. Woodwork and mechanical drawing excelled in units, students, and percent of professionally trained teachers. A wider variety of industrial arts subjects was found in the latter years of the survey, mostly in the large schools.

946. MAYNARD, LOUIS JACKSON (Masters). ***Trends in Trade and Industrial Education in the Secondary Schools of Oklahoma.*** **Oklahoma A. & M. College, 1940.**

947. McCONNELL, JOSEPH L. (M.S.). ***Trends in Mechnical Drawing Based on an Analysis of Textbooks Published From 1900 to 1934.*** **Iowa State College, 1936. 60 p.**

A survey to discover trends in mechanical drawing based on an analysis of textbooks published from 1900 to 1934 inclusive, and further, to discover, if possible, how mechanical drawing textbooks may be improved as to teaching methods and content.

948. McCORD, WILLIAM M. (Masters). ***Sixty Years of Industrial Arts in Louisville, Kentucky.*** **University of Kentucky, 1941.**

949. McKENNA, ARTHUR ERNEST (M.S.). ***A Survey of Textile Schools and Departments in Southern Colleges.*** **University of Tennessee, 1933. 122 p.**

A history and development of textile schools in the United States, including the enrollment and course trends. Data was obtained from a survey conducted in 1933. Consideration is given to the need for closer co-operation between the textile schools and the textile industry.

950. McQUEEN, JAMES (Masters). ***Development of the Technical and Vocational Schools of Ontario.*** **Teachers College, Columbia University, 1933.**

951. McTAGGART, ARTHUR JOSEPH (M.S. in Ed.). ***Vocational Rehabilitation in the United States.*** **Cornell University, 1943. 175 p.**

A study of the history and development of the vocational rehabilitation program for the disabled. An historical treatment is expanded into a forecast of the things that may be expected in this area. The effect of industry and the military on the rehabilitation of the disabled is discussed.

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952. MENEGAT, PAUL ANTHONY. ***History of Trade and Industrial Education in Oregon.*** **Ed.D., 1953, Oregon State College. 342 p. Library, Oregon State College, Corvallis.**

Purpose: To show the development of trade and industrial education from its beginning to the present time as a definite part of the public school program of Oregon.

Source of Data: Data were obtained from the State Department of Education, at Salem, the U. S. Office of Education in Washington, D. C., local school districts, school board minutes, old newspaper files, personal visits, interviews, and a questionnaire.

Findings and Conclusions: Development of trade and industrial education in Oregon was slow during its early stages. Increased emphasis was given with the passage of the Smith-Hughes Act in 1917. The diversified occupations program originally developed in Oregon in 1926 has grown from one center to twenty-two centers. During the years 1940–1945 the war training program developed from four classes in four centers to ninety-five classes in thirty-two centers. With the exception of a technical high school and the three regional vocational schools, most of the trade and industrial educational programs are conducted in comprehensive high schools. Some special developments of a pioneering nature include: classes in practical nursing, classes in placer mining, and classes in foremanship training. During the fiscal year 1945–46, an outstanding development was the large number of World War II veterans entering apprenticeship training.

953. MILLER, MARION M. (M.A.). *William Morris' Contribution to the Modern Arts and Crafts Movement.* Columbia University, 1943. 23 p.

A biography of William Morris and his influence on arts and crafts. It points out factors and people influencing his early life and describes his work in specific crafts including dyeing, weaving, needlecraft, wall paper, printing, and furniture.

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954. MILLER, MURRAY LINCOLN. *Development of Factors Relating to Industrial Arts Education in School Surveys.* Ph.D., University of Pittsburgh, 1947.

A study of the growth of industrial arts from 1907 to 1941. The study emphasizes the long time required for new ideas and principles to take effect and the positive relationship between the growth of industrial arts and the professional advancement of personnel.

955. MISSIMER, GEORGE ELY. *William Thomas Bawden—A Study of His Life and Works Up to 1935.* M.S. in Ind. Ed., Kansas State Teachers College, 1943. 188 p.

Biographical report on the life and works of W. T. Bawden, to 1935.

956. MONTGOMERY, WILTON EVERETT (M.A.). *The Development of Industrial Education in San Antonio, Texas.* University of Texas, 1934. 105 p.

A history of the development of industrial education from the days of the Spanish Missions to the present-day period of the vocational and technical school. Growth is indicated by the number of students, types of training, and equipment available.

957. MOORE, HERSCHEL. *Steel—A Content Study in Industrial Arts.* M.A., 1950, Ohio State University. 129 p. Education Library, Ohio State University, Columbus.

Purpose: To show the history of steel; the mining of ore; the reduction and refining of the ore; the properties of steel; the use of steel; and the implications for industrial arts.

Source of Data: A review of the history of steel. A study of the steel manufacturing practices as reported in technical books and periodicals. A study of the statistical reports on steel production, applications, and employment. A study of technical books and reports to reveal the properties of steel. Consultation with company officials and the research bureau on the latest practices.

Findings and Conclusions: Experiences in forging, casting, and machining of metals offer good opportunities in industrial arts to learn the properties and uses of a variety of steels. An understanding of the diversity of occupations pertaining to the production of steel and its application should make a substantial contribution to vocational guidance and may well be one of the outcomes achieved through working with steel in the industrial arts laboratory. Data presented shows that steel has played an important role in man's progress toward achievement of a higher standard of living. The production and consumption of steel annually are increasing, with the result that man is becoming increasingly dependent upon its products.

958. MOORE, PAUL JASPER (M.S.). *History and Development of Vocational Education in Kingsport, Tennessee.* University of Tennessee, 1948. 120 p.

An historical development of Kingsport, Tennessee, as a city and a description of the public school system of Kingsport with emphasis on the vocational program from 1928 to 1948. A comparison of the development of vocational training with the growth of the community is included.

959. MORELAND, ROBERT MORRIS. *A History of Industrial Arts in Oregon to 1950.* M.S., 1953, Oregon State College. 70 p. Library, Oregon State College, Corvallis.

Purpose: To compile the history of industrial arts in Oregon.

Source of Data: Data were secured from periodicals, school superintendents' reports, newspapers and historical accounts.

Findings and Conclusions: Industrial arts developed with expanding enrollments and as the school sought to align their programs with modern needs.

960. MORISETTE, C. W. (M.S.). *Modern Cupola Operation—A Documentary Study of Information Concerned with Cupola Operation as Disclosed in Trade Periodicals for the Years 1929 to 1939.* The Stout Institute, 1939. 94 p.

An historical study of the cupola operation based on a survey of the trade periodicals from 1929 to 1939 and on the author's experience in this field. A list of the steps and other factual information concerning this process is included.

961. MORRISON, DARNALL W. (M.S.). *A Course in Beginning Woodwork for Junior High Schools.* University of Tennessee, 1936. 214 p.

A history of industrial arts from primitive days to 1936, including a survey of courses and objectives of beginning woodwork. An eighteen weeks course outline for junior high schools designed for the use of the teacher as a guidance function is presented.

962. MOYER, WILBUR J. (M.S.). *A Comparative Study of the Years 1931–36 and 1941–46 in Industrial Arts Education.* Pennsylvania State College, 1947. 111 p.

A comparative study of the history, philosophy, organization, subject content, and methods of teaching industrial arts in order to determine the changes that have come about in these fields over a period of years.

963. MURPHY, MATTIE B. *Trends in Vocational Education: Changing Concents of Values.* M.A., St. Louis University, 1934. 136 p.

A historical study of the differences between vocational, cultural, and practical education, with special emphasis on vocational education and its progress. Analysis of the attempts at adjustment of the cultural and practical needs.

964. MYRICK, G. E. (M.S.). *Trends in Industrial Arts Education.* East Texas State Teachers College, 1940. 137 p.

An historical and philosophical study tracing the development of industrial arts in the United States to its position in general education in 1940.

965. NETTLES, EVA (Masters). *A Study of Vocational Education in Bogalusa, Louisiana, during 1930–43.* Louisiana State University, 1943.

966. NORMAN, RALPH P. *Teacher Training Data.* M.A., University of Minnesota, 1947.

A table listing all courses in industrial arts at the University of Minnesota and their instructors for the period from 1915 to 1925.

967. PARKER, EDWARD A. (M.S.). *Trends in Industrial Arts and Vocational Education in Montana, 1931 to 1937, Inclusive, with Suggestions for Improving Industrial Arts Teacher-Education Work in Montana Colleges.* Iowa State College, 1938. 92 p.

A study covering all public junior and senior high schools in the state of Montana which offer either industrial arts or vocational education. It covers the period 1931 to 1937 inclusive.

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968. PARKHILL, GEORGE DEWEY (Ed.D.). *The Genesis, the Present Status, and Possible Development of Vocational Education in the City of New York.* New York University, 1938. 245 p.

An historical study of vocational education from 1900 to 1938. It includes the current needs of vocational education and its role in the city of New York. Federal and state laws regarding vocational education are described.

969. PATUREAU, STEPHEN IRWIN (M. A.). *A History of the Isaac Delgado Central Trades School (New Orleans).* Tulane University, 1939, 104 p.

Historical study of the development of the curriculum, physical plant, and administration of the Isaac Delgado Central Trades School in New Orleans. Courses of study available in 1939 are included in an appendix.

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970. PEIFFER, HERBERT CLAIRE, JR. (Ed. D.). *Vocational Education in California under the First Commissioner of Industrial and Vocational Education.* Stanford University, 1939. 317 p.

A review of the development of vocational education in California from 1900 to 1925. Significant trends are stressed.

971. **PIERRARD, THOMAS ARTHUR** (M. A.). *A Study of Financial Aid to and the Direction of Vocational Education in Indiana by the Federal Government.* Indiana State Teachers College, 1938. 101 p.

A review of the development of vocational education in Indiana and of various types of federal aid programs which have allocated money to Indiana.

972. **POWELL, JOHN C.** (M. A.). *A Study of the Development of Industrial Arts in Junior High Schools of First Class Cities in Kansas.* Ohio State University, 1940. 94 p.

A study of the cultural and industrial trends in Kansas along with existing patterns of industrial arts programs in twenty-two junior high schools. An historical development of industrial arts in Kansas is included.

973. **POWERS, ROBERT L.** *The History of the Four-State Conference on Industrial Arts and Vocational Education.* M. S., 1955, Kansas State Teachers College. 202 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To prepare a detailed history of the Four-State Conference on Industrial Arts and Vocational Education.

Source of Data: Data were secured through interviews with some of the originators; reviews of bulletins, newspapers, and correspondence with association officers of the four states, Missouri, Kansas, Arkansas, and Oklahoma.

Findings and Conclusions: The Conference was organized in January, 1938. All meetings of the conference have taken place at Kansas State Teachers College, Pittsburg, Kansas. The conference grew from a specialized regional conference on Industrial Arts into its present status of a general regional conference that covers not only the various areas of Industrial Arts but also covers some divisions of Vocational Education and Veteran's Training.

974. **PLUMLEE, WILLIAM** (Masters). *Industrial Arts History, Practice, Trends and Possible Future Status.* Western State College, Colorado, 1942.

975. **PROKOP, ARNOLD FERDINAND** (M. A.). *Gainful Occupations and the High School Curriculum.* University of California at Los Angeles, 1940. 87 p.

A study of the gainful occupations in which students are employed, and the relationships of the school curriculum to these occupations. Vocational education from 1893 to the present is reviewed.

976. **REDMAN, ALONZO L.** *Booker T. Washington and Tuskegee Institute.* M. A., University of Minnesota, 1943. 90 p.

A study of Dr. Washington's educational and social ideals, with particular reference to his contribution to the philosophy and practice of vocational education.

977. **REGNIER, ARTHUR W.** *The History and Development of Industrial Arts in the Public Schools of Kansas (Non-Vocational).* Kansas State Teachers College, 1933. 66 p.

978. **RIDER, EUGENE H.** (Masters). *A History of Industrial Arts Education in Ohio State Higher Institutions.* Bowling Green University, 1941.

979. **RITCHIE, PERRY L.** *A History of Vocational Education in Dayton, Ohio.* M. Ed., University of Cincinnati, 1945. 161 p.

A historical account of the growth and development of vocational education in Dayton, Ohio.

980. **RITTER, JOHN THOMAS.** *The Influence of Comenius Upon Current Interpretations of Industrial Arts.* M. S., 1952, North Texas State College. 63 p. Library, North Texas State College, Denton.

Purpose: To ascertain the influence of Comenius upon current interpretations of industrial arts.

Source of Data: Data were obtained from books, pamphlets, periodicals, and bulletins concerned with the education, life, work, and philosophy of John Amos Comenius.

Findings and Conclusions: The idea of manual training, as incorporated within the school curriculum, stemmed from the philosophy and writings of Comenius. There is some similarity between Comenius's philosophy and the current philosophy of industrial arts.

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981. ROBINSON, WALTER JULIUS. *Origin and Development of Industrial Education in Louisiana.* Ed. D., 1950, Missouri University. 370 p. Library, University of Missouri, Columbia; Library, Northwestern State College, Natchitoches, Louisiana.

Purpose: To trace the origin and development of industrial education in Louisiana up to 1950 and to assist in clarifying the thinking of school administrators, teachers, and laymen as to the nature and purpose of the various industrial education programs operating in the State.

Source of Data: Information was collected and compiled from the following sources: Legislative acts; minutes of the proceedings of the State Board of Education; college catalogues; educational journals; unpublished master's theses; newspapers; reports from parish superintendents and State trade school directors; and reports from industrial organizations. From these sources data were brought together in one document revealing the background and status of industrial education in Louisiana.

Findings and Conclusions: Industrial education began in Louisiana in 1835 in the form of a manual labor school. The first formal course of industrial education to be offered on an organized basis in the schools of Louisiana was a manual training course which began in the City High School in Monroe, 1902. In 1876 sloyd training was introduced in the preparatory department of Tulane University. In 1908 sloyd was introduced in the elementary schools of New Orleans. In 1910, sloyd was replaced with manual training. Excluding two vocational-industrial schools in New Orleans, all vocational industrial education provided at public expense is conducted by 10 area trade schools. The State trade school movement began in 1934. Between July, 1940 and August, 1944, over 70,000 people were trained for war work in these schools. Between 1940 and 1950, War Production Training, distribution of war surplus property, and converting the Louisiana school system to a 12-year plan exerted the greatest influence in developing the total industrial education program in the State.

982. ROGGE, LOUIS H. (M.S.). *An Historical Survey of the Du Pont Manual Training High School of Louisville, Kentucky.* The Stout Institute, 1938. 130 p.

An historical development of the manual training program in Louisville, Kentucky, based on the school records of the Du Pont Manual Training High School. It includes course content, teacher tenure, and trends and buying power of teachers' salaries.

983. ROSENBERG, LEWIS B. (M.S.). *History and Development of Industrial Arts Education in Los Angeles.* University of Southern California, 1939. 147 p.

A survey tracing the development and growth of industrial arts. It shows the importance and need of industrial arts in the curriculum of the secondary schools of Los Angeles.

984. ROWLETT, JOHN D. *A Study of the Craftsman of Ancient and Medieval Civilizations to Show The Influence of Their Training on Our Present Day Method of Trade Education.* M.S., 1950, North Texas State College. 93 p. Library, North Texas State College, Denton.

Purpose: To point out the evolutionary trends in trade training from the beginning of recorded history until the present.

Source of Data: A critical analysis was made of trade training programs in the past with respect to their influence on present day training techniques.

Findings and Conclusions: Training on the job is the most effective means of trade education. In the average high school, the trade training programs are falling far short of their capacity to meet the needs of industry. It seems that the apprenticeship program advocated by the Federal Government is an evolution of the old guild apprenticeship. If it were supported by all parties concerned, an effective means of trade trading might be found.

985. 1,106 SAMPLES, JEWELL K. (M.S.). *The Industrial Arts Program as Organized in Virginia.* University of Tennessee, 1948. 102 p.

An historical approach to the industrial arts program of the public school system of Virginia including a brief historical sketch of the program throughout the U. S. A. (1888–1948). The scope of the program, its objectives, and some typical methods of operation are discussed.

986. **SCHMID, HARRY C.** (M.Ed). *Trends in Trade and Industrial Education in the Public Schools of the City of Minneapolis.* Colorado Agricultural & Mechanical College, 1940. 100 p.

A review of the trends in trade and industrial education in the public schools of Minneapolis. Topics such as total annual enrollments, number of teachers employed, number of students placed, number of courses offered, cost of buildings, cost of instruction, cost of equipment, and the amount of money spent by Federal, State, and local governments in support of vocational education programs are discussed.

987. **SCHWALM, RAY ALVIN** (M.S.). *A Survey of the Content of the Industrial Arts Graphic Arts Area in the Commonwealth of Pennsylvania Schools.* Oregon State College, 1948. 125 p.

A brief history of the development of printing techniques and materials and of the development of the graphic arts in U. S. public schools. The survey shows what the schools are teaching in the graphic arts field and the importance of the area in relation to other industrial arts areas. The appendix includes the steps necessary for performing jobs.

988. **SEAMAN, WILLIAM M.** *Earl L. Bedell and His Contributions to Vocational Education.* M.Ed., 1949, Wayne University. 39 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To present a biographical sketch of Earl L. Bedell.

Source of Data: Data were obtained from the Educational Index, The Index to Periodicals, Mr. Bedell's personal files, and interviews.

Findings and Conclusions: Important contributions to industrial and vocational education have resulted from his efforts.

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989. **SEARS, WILLIAM P., *Jr.*** (Ph.D.). *The Roots of Vocational Education.* New York University School of Education, 1930. 383 p. Published: J. Wiley & Son, New York, 1931.

A review of origin and development of organized and controlled vocational education, with emphasis on trade and industrial education. The influence of the industrial, political, social, and educational fields is considered.

990. **SEELEY, WARREN A.** (M.S.). *The Program of Trade and Industrial Education Under the Tennessee State Board for Vocational Education—Its Development and Possible Further Expansion.* University of Tennessee, 1947. 241 p.

An historical and statistical review, from 1916 to 1946, of the phases, types of classes, and programs in vocational trade and industrial education under the State Board for Vocational Education.

991. **SHEPHRED, JOHN SHERMAN.** *The Moundbuilders: Their Arts and Crafts.* M.A., 1950 Ohio State University. 152 p. Education Library, Ohio State University, Columbus.

Purpose: To give readers an appreciation of the accomplishments of a primitive society and to show the difficulties confronting them, and how they met these problems.

Source of Data: Survey of historical materials and literature, interviews, conferences with authorities, lectures by authorities and trips to mounds.

Findings and Conclusions: The activities carried on by the Moundbuilders are comparable in many ways to those encountered in industrial arts today. A study and comparison of methods and activities of the Moundbuilders should suggest interesting materials and activities for the enrichment of a program of industrial arts.

992. **SHERMAN, ALLEN J.** (M.S.). *Learning Content in Violin Making for Industrial Arts Students.* Iowa State College, 1940.

A study of the history of the violin, how it developed, how the master makers worked and lived, whence came their materials, and how violins are made today.

993. **SHIPP, OWEN TWAYNE.** *The Influence of the Manual Labor Movement on Industrial Arts in America.* M.S., 1950, North Texas State College. 77 p. Library, North Texas State College, Denton.

Purpose: To trace the influences of the manual labor movement on industrial arts in America.

Source of Data: Data for the study were obtained from books, magazine articles, public documents and unpublished materials.

Findings and Conclusions: The manual labor movement did not greatly influence industrial arts in America. Manual labor schools cannot be looked upon as continuing the direct line of development in manual education any more than the mechanic's institute movement or the trade schools. All of these movements were segments which, when put in one piece, make up industrial arts as we know them today.

994. **SIDDALL, ELIZABETH.** *The Architectural Significance of the Fireplace.* M.S., North Texas State College, 1947. 100 p.

An account of the development and function of the fireplace in the home.

995. **SIMON, HAROLD CHARLES** (Masters). *Movement toward Vocationalization of Secondary Education in the United States.* Southern Methodist University, 1931.

996. **SKIRVIN, EMMETT E.,** *Jr. A History of the Development of Industrial Arts At San Diego State College from 1902 to 1953.* M.A., 1953, San Diego State College. 88 p. Library, San Diego State College, San Diego, California.

Purpose: To give an historical account of the events that have lead to the present industrial arts program at San Diego State College.

Source of Data: Data were secured from San Diego State College catalogs and from interviews with persons who participated in the development of the present industrial arts program.

Findings and Conclusions: Industrial arts courses, called manual training were first offered in 1902 at the San Diego Normal School. New courses were added in 1905, 1916, 1919, and 1921. In 1938 the work was transferred to the Departments of Engineering and Fine Arts. The Industrial Arts Department was reorganized in 1947 after which it grew rapidly. In January, 1953, it moved into a new building. With steadily increasing enrollment, new equipment, new courses, and additional staff members are being added.

997. **SMELKIN, J.** (Masters). *The Mechanics' Institute Movement in America, to 1860.* College of the City of New York, 1936.

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998. **SMITH, HERBERT EDWARD** (Ph. D.) *The Historical Development of Technical Education in the First Nine Colleges Founded in the United States, 1636–1862.* New York University, School of Education, 1940. 424 p.

A study of the curriculum, both graduate and undergraduate, in technical education in the nine colleges founded before the American Revolution. The forces that have played a part in the development of technical science in these colleges are described.

999. **SNIDOW, HAROLD J.** (M.S.). *Changes in Industrial Arts Methods of Teaching in the United States since 1900.* Colorado Agricultural & Mechanical College, 1941. 64 p.

A review of the changes in methods of teaching industrial arts subjects from 1900 to 1940. The changes are traced from the early experiments in America to furnish industrial education up to the development of the general shop of today.

1000. **SOOTER, JOYCE M.** *A History of Layout Tools Used in the Woodworking Shop.* M.S. in Ind. Ed., 1950, Kansas State Teachers College. 124 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To rename the grouping of layout tools, to picture these tools by written description and photography, and to show their influence on industry.

Source of Data: Museum visitation, interview, and early records were the primary sources of data.

Findings and Conclusions: Tools, throughout the ages, have been made by the workmen themselves to fit the job on which they were working. They have taken a variety of sizes and shapes, their classification depending upon the task which they were to perform. Tools no longer represent the efforts of an individual but represent human effort over the entire world from the beginning of organized society.

1001. **SPAIN, CHARLIE** (M.A.). *Development of Trade and Industry as a Unit of Instruction.* George Peabody College, 1937. 75 p.

An historical study of trade and industry to the time of the first World War, based on textbooks, histories of trade and industry, and on periodicals.

1002. **SPENCER, ROY SMITH.** *The Development of Industrial Education at West Kentucky Vocational School.* M.S., 1954, Tennessee Agricultural and Industrial State University. 71 p. Library, Tennessee Agricultural and Industrial State University, Nashville.

Purpose: To trace the development of industrial education at West Kentucky Vocational School.

Source of Data: Data were obtained from school records and publications.

Findings and Conclusions: Between 1910 and 1918, West Kentucky Industrial College was a private institution without state support. In 1918, the Kentucky Legislature passed a bill in both Houses making the institution a state supported school. In 1938, West Kentucky Industrial College became West Kentucky Vocational Training School, a secondary school.

1004. STERLING, CHESTER LEROY (M.A.). *History of Industrial Education in the Pittsburgh Public School System.* University of Pittsburgh, 1933. 129 p.

An historical study of industrial education in the Pittsburgh public school system in an effort to point up the significance of this development to both the students and the community. Past experience is described in an effort to aid future development.

1005. STOFFER, ROBERT JOHN (M.A.). *Trade and Industrial Education in California.* Stanford University, 1937. 130 p.

A history of trade and industrial education in California from 1917 to 1937.

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1006. STOMBAUGH, RAY MERTON (Ph.D.). *A survey of the Movements Culminating in Industrial Arts Education in Secondary Schools.* Columbia University, 1936. 192 p.

Traces the influence in industrial arts education from 1871 to 1936, identifying certain major movements in industrial arts education and considering various designs and expedients which teachers have found useful. Public and private manual training schools and the development of industrial arts teaching methods and devices are considered.

1007. STRUNK, GRANVILLE BENNETT. *History and Status of Industrial Arts in New Mexico Since Statehood.* M.S., Oklahoma Agricultural and Mechanical College, 1941. 110 p.

An account of the development and status of industrial arts in the public schools, with recommendations for its improvement.

1008. SULLIVAN, INMAN E. *History of Periodicals Devoted to the Interest of Indunstrial Arts Teachers.* M.S., 1953, Oklahoma Agricultural and Mechanical College. 72 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To present an account of the founding, development and influence of magazines directed to industrial arts.

Source of Data: Data were obtained from various magazines.

Findings and Conclusions: The magazines have contributed to the development of better teaching methods, better selection of equipment, planning of industrial arts shops, shop organization and management, project plans, teaching aids, and methods of testing and evaluation.

1009. SWAGERTY, BERLE A. *Historical Development of Adult Education in Oklahoma City Since 1908.* M.S., 1954, Oklahoma Agricultural and Mechanical College. 61 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To trace the development of adult education in Oklahoma City from 1908 to 1952.

Source of Data: Data were obtained from records of the Board of Education, interviews with those who were connected with the early days of the night school, early newspaper reports, and records in the adult education office.

Findings and Conclusions: Adult education is a very important part of the Oklahoma City school system. It is desirable that the public and the teachers understand the functions of adult education.

1010. THOMAS, JAMES E. *The Industrial Arts Program of Oak Ridge Schools, Oak Ridge, Tennessee.* M.S., 1950, University of Tennessee. 131 p. Library, University of Tennessee, Knoxville.

Purpose: To examine and describe the industrial arts program of the Oak Ridge Schools, Oak Ridge, Tennessee.

Source of Data: Data were secured from the files of a curriculum workshop of Oak Ridge teachers and from reports of industrial arts programs from other localities and States.

Findings and Conclusions: A brief history of the development of the Oak Ridge school system from 1943 to 1950 is given, including the industrial arts program in the elementary, junior and senior high schools.

1011. THOMAS, RONALD BURTON. *A Comparative Study of the American Vocational Association and American Industrial Arts Association.* M. Ed., 1952, Wayne University. 69 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To compare the American Vocational Association and American Industrial Arts Association, their history, functional pattern, projected plans, findings, and recommendations.

Source of Data: Data were obtained from industrial education leaders and records. The historical and comparative methods were used.

Findings and Conclusions: Both organizations have similar functional patterns. The American Industrial Arts Association is more democratic in its selection of officers than the American Vocational Association. The two organizations promote industrial arts.

1012. THOMPSON, ALBERT M. *Sr. Distribution and Frequency of Industrial Arts Courses Taken by Industrial Arts Graduates at Langston University, 1939–54.* M.S., 1954, Oklahoma Agricultural and Mechanical College. 40 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To sketch the history of the industrial arts program at Langston University and to learn the frequency of courses taken by the graduates.

Source of Data: Data obtained from Langston University catalogs and records.

Findings and Conclusions: Generalization of required courses is not desirable. Graduates appear to elect those courses which would prove most significant financially during their post-college life.

1013. THOMPSON, KENNETH T. *The Development of Prefabricated Housing.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 139 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To show the growth of the prefabricated housing industry from 1892 to 1950.

Source of Data: An historical account of the prefabricated house.

Findings and Conclusions: Deals entirely with a discussion of the prefabrication industry in the continental United States from its beginning to its present state. It has grown rapidly since 1949 and has become an established part of the home building industry.

1014. TODD, WILLIAM LEE (M.Ed.). *Development of Vocational Education with Special Reference to the Public Schools of Texas.* University of Texas, 1947. 138 p.

Describes the development of vocational education in the public schools of Texas (1903–1947) in comparison with other developments within the State, particularly in respect to financial support and the vocations concerned.

1015. TREASE, JOHN L. *The Status of Industrial Arts in Kansas High Schools, 1950–51.* M.S., 1951, Oklahoma Agricultural and Mechanical College. 87 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To trace the development of industrial education from its early beginnings to the present status in the high schools of Kansas.

Source of Data: Data were obtained from 341 industrial arts teachers, documentary sources, and records of the Kansas State Department of Public Instruction.

Findings and Conclusions: During the school year of 1950–51, industrial arts courses were being offered in 441 of the 677 accredited public and private high schools in the State of Kansas. Special training for teachers ranged from zero to ninety semester hours of technical work, with an average of 37.4 semester hours. Fifty teachers were completing their first year of teaching, and 17 were finishing 30 years or over.

1016. TROUT, BENTON REEVES (M.S.). *Industrial Arts Teacher-Education in California; Its Development and Present Requirements.* Oregon State College, 1940. 58 p.

A review of the history of the industrial arts teacher training program in California from its beginning in 1890 to 1935.

1017. TRUEBLOOD, B. C. (M.S.). *The Development of the Itinerant Program in Wisconsin.* Colorado Agricultural & Mechanical College, 1934. 118 p.

An historical study of the development of the itinerant program in Wisconsin to determine the facts and policies that have been responsible for its growth and success. The legal and administrative problems involved are noted. Recommendations based on community needs are offered.

1018. UMHOLTZ, *Jr.*, JAMES KARL. *The History and Development of Vocational Education in the Elizabethton, Tennessee, Area.* M.S., 1954, University of Tennessee. 63 p. Library, University of Tennessee, Knoxville.

Purpose: To record the history and development of vocational education in the Elizabethton, Tennessee, area.

Source of Data: Data were secured from the Chamber of Commerce, local newspaper, state employment office, United States Census reports for 1950, various school files, former graduates, and interviews with executives in industry.

Findings and Conclusions: In 1953–54 the Elizabethton High School offered two vocational subjects, thirteen subjects contributing to vocational effectiveness and thirty general subjects. Approximately one-half of the boys were enrolled in industrial arts, about one-third of all students were enrolled in commercial subjects, and 73 per cent of the girls were enrolled in home economics. Seventy per cent of the students in diversified occupations were employed in the occupations for which they were trained.

1019. URGELL, FRANCISCO C. (M.S.). *An Evaluation of Industrial Arts Education in Puerto Rico.* Pennsylvania State College, 1938. 175 p.

An historical presentation of the development of industrial arts education in Puerto Rico beginning with the occupation of the Island in 1898 by the United States and extending through 1938. Teacher education, building and equipment, and the courses of study are evaluated.

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1020. URGELL, FRANCISCO C. (Ph.D.). *The Development and Contemporary Problems of Vocational Education in Puerto Rico.* Pennsylvania State College, 1941. 292 p.

Traces the development of education in agriculture, home making, industry, vocational rehabilitation, distributive education, and guidance from the American occupation, 1898 to 1941. The schools, teacher preparation, and curricula are considered.

1021. URLAUB, JOHN M. (M.A.). *A History of Vocational Education in Oregon State Since 1917.* School of Education, University of Oregon, 1939. 78 p.

A history of the progress and evolution of various phases of vocational education on the secondary level in Oregon from 1917 to 1939. The effects of vocational education in the public schools systems and in the state institutions are noted.

1022. VALLMER, O. E. *Some Significant Historical Aspects of Manual and Industrial Education to 1870.* M.S., 1950, East Texas State Teachers College. 60 p. Library, East Texas State Teachers College, Commerce.

Purpose: To investigate the purpose, changes and improvements in manual and industrial education during the years before 1870.

Source of Data: Data were secured from text books, reference books, library books, and encyclopedias obtained from library findings.

Findings and Conclusions: Labor and learning before the renaissance were purely imitative and mechanical. The relationship between things and thoughts was believed to be learned by mere repetition. Training the hand was a means of training the mind. Handwork became a fundamental means in education.

1023. VAN BEVERS, CLELL (Masters). *The Historical Development of Vocational Education in the United States.* East Texas State Teachers College, 1940.

1024. VAUGHT, NEELEY R. *The Evolution of Cornice.* M.S., 1951, North Texas State College. 121 p. Library, North Texas State College, Denton.

Purpose: To investigate the historical development of cornice as an element in architectural design.

Source of Data: Data were obtained from books and encyclopedias.

Findings and Conclusions: Cornice, carved in stone, was incorporated by the ancient Egyptians in their temples, palaces, and walls. The Assyrians began the process of molding cornices in order to produce special designs in brickwork. In more modern times, since the Gothic and Renaissance eras, little has been done toward furthering the evolution of cornice.

1025. **WALLACE, NEVA S. (Masters).** *The Origin and Development of the Diversified Occupations Program in the Southern Region.* Mississippi State College, 1943.

1026. **WARD, ARTHUR W.** *Tuskegee Institute, Its Evolution and Contribution to Industrial Education.* M.S. in Ind. Ed., 1949, Kansas State Teachers College. 108 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To give a brief history of the founding and development of Tuskegee Institute and to review its program of offerings in industrial and vocational education and teacher training in these fields.

Source of Data: Analysis of letters, encyclopedias, periodicals, theses, catalogs, autobiographies, biographies, and other reference readings.

Findings and Conclusions: Founding of Tuskegee helped to bring about a new concept of Negro education in Alabama. Tuskegee graduates have achieved success in many different lines of work in many states and have promoted the welfare of the Negro race. Many teachers have received their training at Tuskegee. Great credit is bestowed upon Booker T. Washington. A wide variety of industrial-vocational courses of a 2-year terminal type is offered by Tuskegee. Emphasis is still placed upon the possibilities of the Negro in agriculture. Homemaking also receives considerable attention.

1027. **WEST, RUSSELL LEWIS (M.A.).** *The Trend of Aviation Courses in Junior Colleges, 1932–1937.* Stanford University, 1937. 174 p.

A survey of curricular offerings of 460 junior colleges in the field of aviation from 1932 to 1937. Developments in the aviation industry during this period are also reviewed.

1028. **WHARTON, LOWELL B.** *Leaders and Legislation for Vocational Education in Kansas.* M.S. in Ind. Ed., Kansas State Teachers College, 1939. 29 p.

An account of the vocational education program in Kansas.

1029. **WHITE, BLAIR M. (M.S.).** *Industrial Arts in the High Schools of Orange County in the Wartime.* University of Southern California, 1943. 106 p.

A study of the change in industrial arts due to wartime conditions. It shows how enrollment and courses change and relates the change to the needs of the time.

1030. **WHITTEN, MAYS KENNETH.** *The Evolution of the Window as a Functional Part of the Home With Special Reference to Architectural Design.* M.S., 1951, North Texas State College. 82 p. Library, North Texas State College, Denton.

Purpose: To trace the evolution of the window as a functional part of the home with special reference to architectural design.

Source of Data: Data were secured from books and magazines.

Findings and Conclusions: The architectural significance of the window gained its greatest importance during medieval times with the Romanesque and Gothic styles of architecture. Standards were in general use in America during the Colonial period when American architecture achieved distinction.

1031. **WILLIAMS, EDWARD L. (M.S.).** *A Study of Industrial Arts Teacher Training in the United States.* A & M College of Texas, 1930. 52 p.

An historical study of the development of industrial arts and the background and status of industrial arts teacher training in the United States up to 1930. A teacher training curriculum is proposed.

1032. **WILLS, WILLIAM W. (M.S.).** *Changes Occurring in Industrial Arts Departments of Certain South Dakota Public Schools from 1929–1934.* Iowa State College, 1935. 76 p.

An investigation of nineteen school systems in South Dakota to determine changes that should be made. The school systems are in towns of 2000 population or more.

1033. **WISEN, MILAN E.** *The History and Manufacture of Plywood.* M.A.E., 1953, University of Florida. 80 p. Library, University of Florida, Gainesville.

Purpose: To assemble historical data concerning the development and use of plywood and to describe the contemporary plywood industry.

Source of Data: Data were secured from literature, commercial publications, and industrial visitation.

Findings and Conclusions: The plywood industry is of sufficient important to warrant study in the industrial arts program—a study beyond the mere use of plywood in making projects.

1034. WOLTER, JOHN R. (M.A.). ***History and Development of Pre-Vocational Education in Pittsburgh, Pennsylvania.*** **University of Pittsburgh, 1935. 47 p.**

A history of the pre-vocational educational movement in Pittsburgh from 1912 to 1935. Trends in this movement for education for retarded pupils are discussed.

1035. WOOD, J. ORVILLE (M.A.). ***The Development of Printing Education in the United States.*** **University of Pittsburgh, 1930.**

A history of printing in the schools of America. It covers public, private, and correspondence schools and colleges and universities. Periods of greatest development are discussed.

1036. WRIEDT, CECIL (M.S.). ***Trends in Industrial Arts Teacher Education Curriculum From 1929 to 1939.*** **Iowa State College, 1939. 53 p.**

An analysis of the curricula of sixteen colleges: four teachers colleges, four universities, four states land-grant colleges, and specialized schools.

1037. ZELLERS, SYLVESTER R. (Masters). ***The Development of Industrial Arts in Cleveland, Ohio.*** **Ohio State University, 1936.**

INSTRUCTION

Courses of Study

Aviation

1038. BURNS, PAUL. ***The Aspects of Aviation Adaptable to Ohio Secondary School.*** **M.A., 1949, Ohio State University. 107 p. Education Library, Ohio State University, Columbus.**

Purpose: To survey and acquire a comprehension of literature concerning air age education. To survey Ohio secondary schools concerning courses in aeronautics; acquire methods of teaching aeronautics in dustrial arts; and its relationship to other subjects besides industrial arts.

Source of Data: Literature research, questionnaire survey in Ohio, job analysis, personal experience, observation.

Findings and Conclusions: Author suggests a course in aviation as an integrated part of the transportation area and gives an excellent structure of his course of study including resources, audio-visual aids and projects.

1039. CORNELISON, EDWARD D. (M.S.). ***Job Analysis of the All-Metal Aircraft Mechanics Trade.*** **University of Southern California, 1940. 82 p.**

A complete curriculum in all-metal aircraft construction work out on the basis of an analysis of the trade.

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1040. GRONEMAN, CHRIS H. ***A Critical Evaluation of the Development of Junior (Model) Aviation Instructional Programs for Schools, Recreational Centers and Model Enthusiasts.*** **Ed.D., 1950, The Pennsylvania State College. 537 p. Library, Pennsylvania State College, State College.**

Purpose: To stimulate the interest of education and recreational leaders toward the favorable consideration of junior (model) aviation.

Source of Data: A survey was made which included review of educational aviation material of State Departments of Education, previous similar studies, books and periodicals, and other research making reference to model aviation. A statistical analysis was made of 231 commercial model airplane kits representing 39 model airplane manufacturers. The study was supplemented by 78 people representing education, recreation, and industry in 23 States. Instructional materials were prepared and tested in 2 large city school systems, and in one large city park recreational center.

Findings and Conclusions: Most State aviation educational programs were decidedly tentative and in a condition of flux, due to the nebulous stage of aviation education. More emphasis is given aviation education in the secondary school than in the elementary. Relatively minor emphasis has been given to the use of model airplanes in teaching aviation education. Several serious problems face educational authorities in the field of model aeronautics. These are: Determining the proper content with reference to interest of aviation education in elementary schools; selecting and classifying most effective instructional materials; providing for adequate inservice training programs in aviation education. Interest and activity shown for development of additional teaching materials for aviation education and model plane building. There is a need for a manual to organize clubs and promote the building of model airplanes.

1041. HACKETT, MARJORIE LEE (M.A.). *Aviation Education in the High Schools in the United States.* George Washington University, 1946. 123 p.

An historical and analytical background of aviation education in the United States at the secondary school level, from its beginning to the date of the thesis.

1042. HARTMAN, PAUL B. (M.A.). *A Study of Air Transportation for Junior High School Industrial Arts Programs.* Ohio State University, 1937. 109 p.

A study of the objectives of general and industrial arts education to show their nature and perspective. It includes the practices in aeronautical education in several locations. Teaching practices, history, evolution, research, and developments of aeronautics are considered.

1043. JULIAN, LESTER JOHN. *Related Technology for Aviation Mechanics.* M.A., 1948, Ohio State University. 73 p. Education Library, Ohio State University, Columbus.

Purpose: To classify related information which may be used as a reference by the aircraft student mechanic.

Source of Data: The variety of information contained in this thesis pertains to the language spoken in the shop of an aircraft manufacturer.

Findings and Conclusions: The topics covered in this thesis will serve as background material for students and workers who might have interest in aviation. The material covered would be essential in any training program in aviation because it eliminates the non-essentials and gives quick working knowledge of the structures of an aircraft, the basic materials and manufacturing processes. The material may also be adapted to programs designed to prepare workers for initial employment, vestibule and on the job training programs. Developments incident to the recent World War have created a definite need for an intensification and expansion of industrial education.

1044. LaBERGE, ARMAND J. (M. A.). *The War Emergency Model Aircraft Project, 1942–1944.* University of Minnesota, 1945. 161 p.

A description of a national emergency activity conducted in the nation's schools, chiefly in industrial arts classes, including the purpose, organization, and procedure at national, state, and local levels. The activities of one junior high school in producing over 2000 planes are discussed.

1045. LAMONT, ARNOLD H. *Aviation in the Comprehensive General Shop.* M. S. in Ed., 1948, Cornell University 47 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To develop a monograph for a unit of activity in aviation in the comprehensive general shop.

Source of Data: Study of available courses of study, books and magazines that have been published. Most of the material is a result of personal observations and conferences with teachers.

Findings and Conclusions: Such problems as: Time allotments, space requirements, equipment, supplies, projects, demonstrations, related lesson topics, demonstration equipment, and sources of teaching materials have been considered and suggestions made for solving the problem.

1046. LASZCZ, FRANK. *A Study of Gliders and Sailplanes with Implications for Industrial Arts.* M. A., 1950, Ohio State University. 95 p. Education Library, Ohio State University, Columbus.

Purpose: To show the possible adaptations in industrial arts of gliders and the construction and flying of sailplanes.

Source of Data: A review of literature from aircraft manufacturing companies, soaring clubs, the Soaring Society of America and international soaring organizations. Other information was obtained through personal interviews with specialists in the field of aviation.

Findings and conclusions: A study of this aspect of flight involves a variety of student activities which should lead to an understanding of aeronautical principles. Its broad scope has implications for almost the entire field of educational activity.

1047. LINCOLN, DONALD R. *Aviation—Its Place and Status in Secondary Education.* M. A., 1950, University of Minnesota. 155 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To provide those interested with facts as to the background and training of today's aeronautics teachers and facilities that colleges and universities provide in this field.

Source of Data: Documentary, personal interviews, correspondence and questionnaires, plus a study of the Civil Aeronautics Administration.

Findings and Conclusions: Rather wide-spread acceptance of aviation as an offering, modified by factors of physical and social nature. There are "major units" and "shorter units" but no typical aeronautics teacher. States vary widely in acceptance of responsibility in higher institutions.

1048. QUICK, OTHO J. *A First Course in Aviation.* M. A., University of Minnesota, 1946. 120 p.

A course of study in aviation to fit the needs and conditions of the industrial arts program in the typical secondary school.

1049. REID, JAMES W. (Masters). *Aviation in the High School Curriculum.* West Texas State Teachers College, 1940.

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1050. SPAULDING, ROLAND HARVEY (Ph. D). *A Contribution to the Technique of Curriculum Making for the Training of Pilots of Airplanes.* New York University School of Education, 1936. 196 p.

The development of a course of study based on a survey of pilots and flight instructors. Piloting techniques, ground school subjects, and actual situations are included (1904 to 1936).

1051. STONE, CHARLES A. (M. A.). *A Vocationalized Aeronautics Program for Secondary Schools.* Stanford University, 1947. 116 p.

A study determining facilities and objectives of aeronautics courses. It was derived from interviews and questionnaires with instructors and personnel from airlines and manufacturers.

1052. THORNTON, FRED R., Jr. (M. S.). *A Proposed Curriculum for Teaching Aircraft Mechanics in the Senior High School.* University of Tennessee, 1946. 136 p.

An analysis of survey questionnaires which were sent to every state in the union in an effort to determine aircraft maintenance training needs. A curriculum is proposed which gives basic information about the essential topics involved in aircraft mechanics.

1053. WOODWARD, RUTH (Masters). *Secondary Aeronautical Education.* Municipal University of Wichita, 1930.

Building Trades

1054. AUBOL, QUENTIN SELDON (M.S.). *Minimalic Construction in the Oregon Schools.* Oregon State College, 1947. 63 p.

A description of the scale-model, frame-building construction program sponsored by the Oregon Building Congress and an evaluation of its growth and accomplishments.

1055. BARTON, WALTER C. (M.S.). *The Educational Experience Inherent in the Construction of a Sioux Indian Home.* Colorado Agricultural & Mechanical College, 1939. 44 p.

A plan for the construction of homes of various sizes to be built by students on the school grounds. The need for training in the school in home-building for Indians is stressed.

1056. BEARD, ELBERT NEAL. *The Construction of a Residence by the General Building Trades Classes at Lawrence County High School, Lawrenceburg, Tennessee.* M.S., 1954, University of Tennessee. 47 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the building trades program at Lawrence County High School, Lawrenceburg, Tennessee, for the years 1948 to 1954.

Source of Data: Data were obtained from records kept by the instructor, from minutes of the Lawrence County Board of Education, and from monthly reports filed with the District Supervisor of Trade and Industrial Education, Nashville.

Findings and Conclusions: During the six-year period covered, a total of one hundred twenty-three boys received from one to two years of training in the building trades. During this period fifty trainees dropped out of school and fifty-four graduated. In addition to developing skills which enabled several boys to secure employment in some phase of the building trades program; projects were constructed by the classes over a four-year period with an estimated value of more than sixteen thousand dollars. A description of the house project is given in detail, including plans, specifications, and procedures involved in planning and construction.

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1057. BOWMAN, ERNEST LAVERN (Ph.D.). *Content and Method in the Teaching of Blueprint Reading for Five Selected Building Trades.* Ohio State University, 1932. 282 p.

A study of the content and method for teaching blueprint reading in carpentry, bricklaying, electrical wiring, plumbing, and steamfitting. It derives principles involved and applies the principles in selecting desired methods and content.

1058. BROWNMAN, DAVID E. (Masters). *Derivation of Trade Technical Mathematics for Plumbers in an Industrial High School.* New York University, 1930.

1059. CAMPBELL, HARVEY B. (M.S.). *Plan Reading for the Building Trades.* University of Kansas, 1935. 262 p.

Essentially an instruction book for teaching plan reading in the building trades. It contains material on graphic representation, geometric construction, architectural indications, scale dimensioning, estimating problems, and a glossary of terms. It is abundantly illustrated.

1060. COFFIN, KENNETH DIX (M.A.). *Determination of the Related Mathematical Content of the Vocational Plumbing Course at the Arsenal Technical Schools, Indianapolis.* Indiana University, 1934. 103 p.

Lesson or job sheets for plumbing courses are analyzed to determine the amount of mathematical calculations or scientific or technical information that is necessary to enable a student to do the job. A course outline of mathematics for the trade is included.

1061. COOPER, THURMAN E. *Correlation of Skill and Information Lessons in Carpentry.* M.S., 1952, Oklahoma Agricultural and Mechanical College. 39 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To prepare instructor's planning sheets and progress charts for a course in vocational carpentry, and to indicate the importance of instructional planning.

Source of Data: Data were obtained from charts and other material in the Department of Trade and Industrial Education, and a survey of available literature.

Findings and Conclusions: Better planning in the correlation of skills and related knowledge is necessary on the part of vocational carpentry teachers. This can be accomplished in part through the use of planning sheets illustrated in the study.

1062. DIMMITT, ROY (M.A.). *An Analysis of the House Painter's Trade for Purposes of Vocational Instruction.* Indiana University, 1933. 108 p.

An attempt to determine the curricular content of the house painter's trade by means of an analysis. It provides curricular content for the training of apprentices and workers in this occupation.

1063. EBERT, EDWIN P. *Analysis of Units of Instruction for Vocational Carpentry.* M.S., 1954, Stout State College. 33 p. Library, Stout State College, Menomonie, Wis.

Purpose: To make an analysis of the units of instruction offered in a vocational program for the preparation of carpenters.

Source of Data: Data were obtained from a review of literature in the field of carpentry, analysis of carpentry units in textbooks and courses of study, analysis of apprenticeship requirements, and an analysis of the carpentry trade.

Findings and Conclusions: While there are basic instruction units in carpentry, there is considerable variance in course content. More emphasis is placed on the "doing" units than on the "knowing" units, and most courses lack guidance information.

1064. HARPER, HERBERT D. (Masters). *Suggested Content for an Industrial High School Course in Mathematics Based on a Job Analysis of the House Builders' Trade.* New York University, 1930.

1065. HIELSBERG, JOHN A. *A Summary and Evalution of the Day Trade Program in Building Construction For Faribault High School From Its Inception in 1946 Through 1951.* M.A., 1952, University of Minnesota. 204 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To follow-up a 1946 survey made in Faribault, Minnesota, that dealt with the need for a building construction program.

Source of Data: Data were obtained from a questionnaire sent to graduates of the program, an analysis of the building construction field, and the author's experience.

Findings and Conclusions: There is a definite need for an expanded vocational program in building construction in Fairbault, Minnesota.

1066. INABINETTE, JOE A. *Phases of Home Planning.* M.S., 1950, East Texas State Teachers College. 95 p. Library, East Texas State Teachers College, Commerce.

Purpose: To present ideas and problems in home planning and to suggest methods of interior decoration.

Source of Data: A model home was constructed, incorporating ideas from many sources. This was described and the planning problems analyzed.

Findings and Conclusions: Thorough study and planning are needed in building a modern home, in order to have good materials, keep down costs, and obtain more efficiency. The average layman needs information on efficient home planning.

1067. JARED, HORACE D. *Production Jobs Completed by General Building Trades Classes for White Students in Tennessee During the Period 1949–1955.* M.S., 1955, University of Tennessee. 115 p. Library, University of Tennessee, Knoxville.

Purpose: To prepare an account of the production jobs completed by general building trades classes for white students in Tennessee, 1949–1955.

Source of Data: Data were obtained through a questionnaire, follow-up letters, and personal interviews.

Findings and Conclusions: All programs constructed projects of definite market value. These consisted of projects for use in the school system, maintenance and repair projects, and new structures for schools and for sale. The total estimated value of these projects was $522,575. The majority of funds were provided by the County Board of Education. Each student received instruction in six trades: carpentry, plumbing, painting, electricity, masonry, and cabinet making.

1068. JOHNSON, MURRELL Y. *A Composite Project for a High School Industrial Arts Course in Which the Basic Fundamentals of Carpentry Can Be Taught.* M.Ed., 1950, Agricultural and Mechanical College of Texas. 30 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To compare the teaching of carpentry by building small projects with on-the-job experience. To ascertain whether a one-semester composite project can be set up for teaching the basic fundamentals of carpentry on the job.

Source of Data: A review of literature was made to ascertain the objectives of carpentry in industrial arts, and operations of various on-the-job projects were analyzed. A model was constructed and analyzed to disclose its suitability as a composite project for high school industrial arts carpentry.

Findings and Conclusions: High school industrial arts carpentry is justifiable. A one-semester composite project of a workshop fulfills the criteria selected.

1069. JOHNSON, RAY WELLINGTON (M. S.). *A course in Home Building and Construction for Secondary Schools.* University of Southern California, 1940. 97 p.

A course of study involving home building and construction, repair, maintenance, design, upkeep, and so forth. The course was designed for Mexican students in a school in Riverside County, California.

1070. JOHNSON, ROBERT P. (Masters). *A Study to Determine the Extent to Which the Ability to Interpret Working Drawings is Required by Workers in the Practice of the Plastering Trade.* University of Pennsylvania, c. 1935–47.

1071. KING, ALBERT S. *The Use of an Apartment-Type Birdhouse to Teach a Carpentry Unit in Industrial Arts.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 36 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the operations and types of construction used in small buildings, and to discover the type of birdhouse construction which would use like operations and constructions.

Source of Data: Data were obtained from books and magazine articles.

Findings and Conclusions: There are some difficulties encountered in the construction of a birdhouse designed along the lines of a real building, but these difficulties can be overcome without major changes.

1072. KLEINER, RUFUS C. *Initiating and Conducting a Vocational Carpentry Program in the Hobart High School.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 41 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To outline a proposal for initiating and conducting a vocational carpentry program in a high school.

Source of Data: Data were obtained from school records and the writer's personal experience.

Findings and Conclusions: A successful carpentry program requires cooperation in financing the building project, an advisory committee, effective instruction, and placement of trainees.

1073. KURLAND, BERNARD (M. A.). *A Proposed Curriculum in Industrial Arts to Improve Housing Conditions.* University of Florida, 1948. 101 p.

The description of a course in industrial arts for the improvement of housing education. It suggests that a course aimed toward improving housing conditions can be made a vital part of the school-community experience.

1074. LUTON, JAMES NORFLEET. *Instructional Units in Plumbing for a General Industrial Building Trades Course.* M. S., 1951, University of Tennessee. 215 p. Library, University of Tennessee, Knoxville.

Purpose: To develop the instructional units for a general industrial building trades course in plumbing.

Source of Data: Data were secured from books, government bulletins, catalogs and descriptive materials from manufacturers, and articles in trade journals.

Findings and Conclusions: Essential information about the plumbing trade includes work performed, working conditions, wage scales, and employment outlook. Technical units involve tools, pipes, fixtures, water supply, drainage and venting. Specimen operation sheets are presented.

1075. MOWBRAY, HERBERT O. (M.S.). *Home Planning for Boys and Girls in Rural Communities.* Colorado Agricultural & Mechanical College, 1941. 140 p.

A course of study to aid students in rural communities to plan a home. Methods of finance, choosing a site, floor plans, types of architecture, construction, water systems, sewage disposal, heating, and lighting are units considered.

1076. RAY, J. EDGAR. *Analysis of the Bricklaying Trade for Instructions Purposes.* M.S., Iowa State College, 1930. 406 p.

An analysis of the bricklaying trade for the purpose of preparing instructional material.

1077. REGAN, FRANK TIMOTHY (M.S.). *A Course of Study on General Contracting and Building Construction.* University of Southern California, 1940. 113 p.

A course of study in general contracting and building construction. It aims to be carefully organized, completely teachable, mature in scope, and vocational in nature.

1078. ROLOFF, ARTHUR DANIEL. *Building Construction as a Practical Arts Core For The Sixth Grade.* M.S. 1953, Oregon State College. 82 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the value of the "minimalic" building construction program.

Source of Data: Data were secured through interviews, observations, books, and pamphlets.

Findings and Conclusions: "Minimalic" construction can develop native abilities that are otherwise overlooked. There are opportunities for the development of democratic sharing and personal satisfaction.

1079. SCHIRHMER, EDWARD BOYDEN. ***Standards for the Vocational Carpentry Programs in Oklahoma.*** **M.S., 1950, Oklahoma Agricultural and Mechanical College. 91 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To put into writing the necessary information and instructions for establishing and operating a vocational carpentry program in accordance with the provisions of the Smith-Hughes and George-Barden Acts, as well as the policies of the U.S. Office of Education, and the Oklahoma State Board for Vocational Education.

Source of Data: Data were gathered by conferences with supervisors and teachers, visits to carpentry classes in Oklahoma, conferences with superintendents where carpentry programs were in operation, and communications with State supervisors of industrial education in all States.

Findings and Conclusions: There is a definite need for a series of bulletins describing in detail, the policies and procedures for the operation of each individual type of vocational program. School administrators are accustomed to written regulatory material and are desirous of such material in the operation of vocational programs.

1080. STERNER, LEWIS H. ***The Carpentry Unit in the General Shop.*** **M.A., University of Michigan, 1938. 140 p.**

Stresses the exploratory value of carpentry as part of the school curriculum, and points toward the incorporation of this program in building trades.

1081. WALDMANN, A. JOHN (M.S.). ***How to Teach Carpentry.*** **University of Southern California, 1939. 151 p.**

A study of the methods, instructional materials, equipment, and procedures to be used by a vocational teacher in teaching a fundamental course in high school carpentry.

Drafting

1082. ADAIR, SAMUEL L. (M.Ed.). ***What Should be Included in a Course in Mechanical Drawing for Ninth Grade Boys.*** **Colorado Agricultural & Mechanical College, 1945. 68 p.**

A course consisting of a series of assignments organized in four separate units: (1) blueprint reading, (2) lettering and sketching, (3) partial instrument drawing, and (4) full instrument drawing.

1083. BARNES, CARL B. (Masters). ***The Logical Organization of Mechanical Drawing Content in High School Courses.*** **Colorado State Teachers College, 1930.**

1084. BARNHILL, MERLE H. ***A Suggested Program of General Drawing for the Senior High School, Cassoday, Kansas.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1940. 72 p.**

An outline of a proposed course in general drafting with instruction sheets and references.

1085. BARSKI, EDWARD F. ***Drafting Practice and School Preparation.*** **M.A., 1954, University of Minnesota. 85 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To ascertain the drafting practices and methods used by industry in the Minneapolis-St. Paul area, and to base the drawing curriculum at Stillwater, Minnesota on these findings.

Source of Data: Data were obtained from personal visits to ten commercial drafting places in the Minneapolis-St. Paul area, a check sheet, and interviews with draftsmen.

Findings and Conclusions: School drafting practices tend to follow books rather than industrial practices. Industry uses short-cut methods. Industrial arts teachers are not well acquainted with drafting practices in industry. School courses and textbooks lag behind up-to-date methods of industry. A list of approved drafting practices is included in a panoramic view of drafting as a vocation is presented in the study.

1086. BEAUCHAMP, THEODORE JULIAN. *Drafting As A Basic Tool In The Vocational Industrial Education Program.* **M.S., 1951, Tennessee Agricultural and Industrial University. 52 p. Library, Tennessee Agricultural and Industrial University, Nashville.**

Purpose: To ascertain the extent to which drafting as a basic tool subject is recognized and used in the general and vocational education curricula in the public high schools of Memphis, Tennessee.

Source of Data: Data were obtained through questionnaires designed to secure information based on recognized facts and needs.

Findings and Conclusions: Mechanical drafting should be included in the high school curriculum. The course should be taught to both boys and girls. There is a definite related value between drafting and other vocational industrial education courses.

1087. BECKHAM, LEO, L. *Teaching Related Information in Vocational Drafting Classes.* **M.S., 1951, Oklahoma Agricultural and Mechanical College. 30 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater .**

Purpose: To provide a suggested guide for the selection of related study assignment topics and guide sheets for use of the instructor of vocational day-trade drafting.

Source of Data: Data were obtained through questionnaires, personal interviews with industrial draftsmen, textbooks, and reference materials.

Findings and Conclusions: Considerable differences exist among teachers as to the relative importance of related information topics. General agreement was obtained as to mathematics, shop terms, types of threads and their uses, human relations, occupational opportunities, blueprint reading and knowledge of reproduction.

1088. BRAUN, LOUIS H. (M.A.). *The Existing Aims of Mechanical Drawing in the Junior and Senior High Schools.* **Colorado State College of Education, 1931. 167 p.**

An evaluation of the objectives in the teaching of mechanical drawing in junior and senior high schools. This study, based on the reports of more than 800 college instructors and secondary school teachers, indicates the need for a mechanical drawing textbook geared at the secondary school level.

1089. BROWN, DEWEY WHEELER (M.A.). *Content of Senior High School Drawing Excluding Art Drawing.* **Municipal University of Wichita, 1933. 80 p.**

Investigates the nature and character of content of drawing for senior high schools in cities of 75,000 to 200,000 population, exclusive of federally aided courses, for the school year 1932–1933. Existing drawing courses are analyzed, and suggestions for improving these courses are offered.

1090. BUCKLES, RALPH. *The Correlation of Junior High and Senior High Drafting with the Other Subjects at the Ecorse High School.* **M.Ed., 1953, Wayne University. 17 p. Department of Industrial Education, Wayne University, Detroit, Michigan.**

Purpose: To show the amount of correlation that exists in drafting with the other subjects at Ecorse High School.

Source of Data: Data were drawn from consultations with the administration and faculty and the courses of study in drafting at Ecorse High School.

Findings and Conclusions: The subjects that show close correlation with drafting as taught are: art, mathematics, photography, and woodshop. The subjects that show no correlation with drafting are: civics, driver training, history, social studies, and string instruments.

1091. CAMBRE, ROLAND JOSEPH. *Mechanical Drawing in the Secondary Schools of Louisiana.* **M.S., 1952, Louisiana State University. 101 p. Library, Louisiana State University, Baton Rouge.**

Purpose: To ascertain the status of mechanical drawing in the public secondary schools of Louisiana.

Source of Data: Data were obtained through questionnaires from all schools in the state offering courses in mechanical drawing.

Findings and Conclusions: The mechanical drawing programs in the public secondary schools of Louisiana varied in many respects. These programs were not consistent in semesters offered, time allotted, amount of work required, credits given, textbooks used, or facilities available. A standard, two-semester drawing course for all secondary schools in the state is recommended.

1092. CHICK, JOSEPH S. (M.Ed.). *Course in Drafting for the Pueblo, Colorado, Schools.* Colorado A. & M. College, 1947. 101 p.

A survey of parents and boys to determine the interests and needs of boys in the Pueblo high schools and to determine the content of the course. Recommendations are offered.

1093. COOK, CHARLES MARSHALL (M.A.). *An Investigation to Derive the Content of a Course in Related Drawing for the Machine Shop Course in an All-Day Vocational School.* University of Pittsburgh, 1933. 90 p.

A study of the attempts which have been made in course construction with emphasis on the problems which arise in the development of content of a course in related drawing for the machine shop course.

1094. CRALEY, DENTON HENRY. *Production Illustration and an Analysis of Pictorial Drawing.* M.Ed., 1952, Wayne University. 250 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To analyze the methods of construction of each type of pictorial drawing used in industry with special attention to production illustration.

Source of Data: Data were obtained from courses taken at the University of Toledo and studies of production illustration in industry.

Findings and Conclusions: The use of production illustration is increasing in industry. It is the function of the schools to turn out competent illustrators. The approach to production is that of an engineer and not of an artist.

1095. DONNELL, JACK R. *A Study to Determine Student Interests and How They Affect Drafting Course Content.* M.Ed., 1952, Agricultural and Mechanical College of Texas. 63 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the interests, characteristics, needs, and problems of the adolescent; to determine the value of certain course content and course scope in a secondary school drafting course, and to make recommendations in light of the findings.

Source of Data: Data were secured from books, periodicals, publications of learned organizations, workbooks, and manuals, and from an experiment under controlled conditions of a secondary school drafting course.

Findings and Conclusions: Drafting courses are becoming more exploratory in nature and are coverering a wider variety of fields. The young adolescent's interest period is very short and varied in many directions. The older adolescent is more stable in his interests. The adolescent likes to belong to a group of his own sex while the older adolescent likes to associate with members of the opposite sex.

1096. DRAGOO, EARL C. *The Planning of a Recreational Cabin as a Drawing Project in Mechanical Drawing.* M. S. in Ind. Ed., Kansas State Teachers College, 1939. 19 p.

A plan for incorporating a unit of architectural drawing in a 9-weeks' course of study in drafting.

1097. ELLIOT, SINNETT R. (M. A.). *Architectural Appreciation for Secondary Schools.* Colorado State College of Education, 1932. 98 p.

A survey of architectural appreciation courses being offered in thirty-one states. A suggested program offering is listed by teachers of such courses.

1098. FOSS, MAURICE F. (Masters). *Functional House Planning Experiences on the Senior High School Level.* Miami (Ohio) University, 1941.

1099. FREEMYERS, RUSSELL LORAINE. *A Survey of Occupations in Butte, Glenn, and Tehama Counties Which Include Drafting.* M. A., 1954, Chico State College. 60 p. Library, Chico State College, Chico, California.

Purpose: To locate and analyze the drafting occupations carried on in the industrial establishments of Butte, Glenn, and Tehama Counties, to ascertain the type, level, and amount of drafting done, and to obtain employers' viewpoints as to the type of drafting that should be taught in high schools and colleges.

Source of Data: Data were obtained through personal interviews and through interview schedules.

Findings and Conclusions: The following types of drafting were found in order of frequency: artchitectural, civil, surface development, structural, mechanical, piping and landscape drafting. In these counties there exists a need for men with two years of college training in general drafting and for men with advanced sheet metal drafting and descriptive geometry for the sheet metal field.

1100. FRENCH, EDWIN WILLIAM (M. A.). *An Investigation to Derive the Mathematical Processes That Should be Taught Trade Mechanical Drafting Pupils Below College Grade.* University of Pittsburgh, 1934.

An attempt to derive a list of valid mathematical processes as one basis for the selection of material for a related mathematics course for trade mechanical drafting pupils.

1101. GERDOM, HENRY F. *A Study of Drafting Methods and Practices Within Indiana Industries.* M. S., 1953, Purdue University. 72 p. Industrial Education Office, Purdue, University, Lafayette, Indiana.

Purpose: To ascertain problems and practices relevant to drafting in industry and the school which will aid in the formulation of effective training principles.

Source of Data: Data were secured by means of two questionnaires. One form was sent to industrial drafting departments and the other form was sent to school drafting departments.

Findings and Conclusions: The schools should maintain close contact with local industries so that they might be aware of changes in practices. A coordinating committee of educators, draftsmen, and industrial leaders should be established to accomplish these goals.

1102. GINN, RAYMOND SYLVESTER, Jr. *A Functional Program of Drawing Instruction for Bibb County Schools, Georgia.* M. Ed., 1952, University of Florida. 93 p. Library, University of Florida, Gainesville.

Purpose: To develop and to present a functional program of mechanical drawing for the eighth and ninth grades of the Bibb County Schools.

Source of Data: Data were secured through planning and experimenting with programs in mechanical drawing for three years, textbooks, magazine articles, professional periodicals, discussion, and observation of programs in progress.

Findings and Conclusions: The junior high student needs exploratory experiences in mechanical drawing and should be provided with learning opportunities which will satisfy his needs.

1103. GREEN, DANIEL (M. A.). *Drawing In the Secondary School—A Crystallization of Aims with Suggestions of Extended Credit.* University of Minnesota, 1932. 139 p.

An historical development of drawing as a school subject. It includes an analysis of textbooks in drawing, courses of study, magazine articles, and secondary educational texts, to attain objectives, to clarify thinking about drawing, and to standardize terminology and content.

1104. GRIFFITH, FULLER O., *Jr.* *Industrial Arts Drawing in High School at a Predictor of Grades in College Drawing.* M.Ed., 1953, Colorado Agricultural and Mechanical College. 52 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the effect of quality and quantity of work done in high school industrial arts drawing on the grades made in the first semester college drawing at the University of Wisconsin.

Source of Data: Data were obtained from the records of 280 University of Wisconsin first semester engineering drawing students. The Chi Square test of significance and the Product-Moment Method of Correlation were used.

Findings and Conclusions: The average grade in high school drawing was the best predictor of success in first semester engineering drawing, with a correlation of .36. The next best predictor was honor points in high school drawing, with a correlation of .099.

1105. GUFFEY, LOGAN. *A Course of Study in General Drawing on the High School Level.* M.S., 1954, Kansas State Teachers College. 50 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a course of study that would give the student a variety of experiences in the broad field of drawing.

Source of Data: Data were obtained from related studies, textbooks in the field, magazine articles, and personal experiences of the writer.

Findings and Conclusions: A thirty-six week course was developed containing the following areas: pictorial sketching, lettering, use and care of equipment, alphabet of lines, geometrical constructions, pictorial drawing and shading, multiview drawing, dimensioning, working drawings, sectional views, auxiliary views, pattern development, home planning, inking, graphs and charts, and furniture construction and design.

1106. HAUENSTEIN, ELI A. (Masters). *A Program of General Drawing for Lima Central High School.* Ohio State University, 1946.

1107. HESS, NORMAN F. (Masters). *Design of a Course in Mechanical Drawing for Public School Work.* Pennsylvania State College, 1933.

1108. HODGE, WILLIAM LEE. *A Proposed Plan for Integrating Mechnical Drawing with the Activities of a Composite General Shop in the Junior High School.* M.S., 1949, Illinois State Normal University. 73 p. Library, Illinois State Normal University, Normal.

Purpose: To formulate a usable plan for integrating mechanical drawing with the activities of a composite general shop and to suggest a suitable method of applying the plan.

Source of Data: Data were obtained by listing the fundamental skills and processes of mechanical drawing and relating these to the work of the shop.

Findings and Conclusions: The suggested plan for integrating mechanical drawing would have pupils make a drawing of the job, list material and procedures, and then construct the object. The important concepts of drawing are concentrated upon rather than drawing skills and techniques.

1109. HODGKINS, EDWIN C. *Audio Visual Materials in Teaching Mechanical Drawing.* M.S., 1950, The Stout Institute. 99 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To determine the opinion of industrial education authorities regarding the proper use of audio-visual materials in teaching mechanical drawing, the conditions existing in the field, and to suggest improvements.

Source of Data: It is a normative survey study. A check list was used to determine the conditions in the field.

Findings and Conclusions: The following summarizations and conclusions were drawn: Use and preferred use of the materials by teachers trained in visual education in greater accord with the opinions of the authorities than the use and preferred use by instructors with no training in visual education. The preferred use of both groups of instructors was better than the actual use. Factors preventing the use of materials affected the two groups of instructors equally. Teachers trained in visual education used audio-visual materials one and one-tenth times more than teachers who were not trained in visual education. A positive relationship existed between the amount of visual education training that teachers had received and the amount of use made of audio-visual materials. A positive relationship existed between the amount of visual education training teachers has received and the correctness of their use of audio-visual materials. It is recommended that teachers use the findings of this study in setting up audio-visual programs, that supervisors use the findings in evaluating such program, and that experimental work be done concerning the adaptability of audio-vasual materials to different types of units.

1110. HOLLENBAUGH, ROBERT RICHARD. *What Industrial Arts Drawing Teachers in Texas are Teaching as Compared with what Authorities in the Field Think Should be Taught.* M.Ed., 1955, Agricultural and Mechanical College of Texas. 60 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain what is being taught in industrial arts drawing in Texas, and to compare this with what authorities in the field think should be taught.

Source of Data: Data were obtained through information forms from industrial arts drawing teachers in Texas and from thirteen authorities on drawing in the United States.

Findings and Conclusions: Texas drawing teachers indicate that they are teaching what authorities recommend.

1111. *Normative Study to Determine Related Content For General Drawing.* M. S., 1953, Agricultural and Mechanical College of Texas. 47 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the types of related information that should be included in a general drawing course, and the emphasis that should be placed on various types of drawing.

Source of Data: Data were secured from books, periodicals, and unpublished materials.

Findings and Conclusions: In a beginning course, as many different types of drawings should be included as possible. Related information should be correlated with the units being done in the drawing room. Occupations relating to the types of general drawing offered should be analyzed and studied.

1112. HUNT, JAMES ROBERT (M. S.). *The Vocational Value of Mechanical Drawing in the Milby Senior High School.* A & M College of Texas, 1939. 30 p.

An attempt to determine the value of mechanical drawing and its vocational implications.

1113. HUTCHISON, HARRY CLARK (M. A.). *A Diagnostic Study of a Trade School Related Machine Drawing Course.* University of Pittsburgh, 1934.

A study to investigate the extent to which an understanding of the principles of mechanical drawing, without practice and experience in translation, develops blueprint reading ability.

1114. ISBELL, TRUMAN T. *A Study To Determine College Recognition of High School Drawing.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 64 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To examine the evidence relating to the value of high school drawing to the first year engineering college student.

Source of Data: Data were obtained from books, periodicals, workbooks, unpublished materials, and questionnaires sent to instructors of drawing in the state.

Findings and Conclusions: First year engineering students with previous drawing experience have higher grades than those with no previous drawing experience.

1115. JONES, CARL N. (M Ed.). *Mechanical Drawing for Second Year High School Boys and Girls in Kansas City, Kansas.* Colorado Agricultural & Mechanical College, 1947. 62 p.

A course of study for senior high school students. The units of instruction were selected through an investigation of the content of sixteen standard textbooks.

1116. KING, KENNETH ARMSTRONG. *Needs in Mechanical Drawing Subject Matter as Indicated by Employers in Grand Haven, Michigan.* M. S., University of Michigan, 1940. 53 p.

A compilation of the more important areas of subject matter for mechanical drawing courses. Data were obtained in the community where they were to be used.

1117. LACK, RUDOLPH L. *A Suggested Course of Study for Industrial Drawing in Oklahoma High Schools.* M. S., 1954, Oklahoma Agricultural and Mechanical College. 56 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To formulate a two-year course of study for industrial drawing in Oklahoma high schools.

Source of Data: Data were obtained from books in the college library.

Findings and Conclusions: The report gives the course of study in outline form.

1118. LIVELY, ROY JAMES. *Blueprint Reading as an Introductory Background for Mechanical Drawing in Junior High School.* M. S., 1953, Oregon State College. 95 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the relative effectiveness of introducing students to mechanical drawing via a short term of blueprint reading.

Source of Data: The experimental group was introduced to mechanical drawing via six weeks of blueprint reading. The control group entered mechanical drawing directly. The experiment lasted one semester. A final achievement test was used to compare results of the two methods.

Findings and Conclusions: The experimental group achieved an average of 11 percent higher mean scores than the control group. The persons with IG's below 100 and/or low mechanical aptitude scores responded very well to the experimental factor. They achieved higher mean scores than the corresponding persons in the control group. The persons of high IG and/or apitutde achieved about equally well regardless of the experimental factor.

1119. LOODE, GARRETT. *The Drafting Area Requirements at General Motors Institute.* M.Ed., 1953, Wayne University. 40 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To establish a definite basis from which the requirements for the physical facility expansion of the "drafting area" of General Motors Institute were justified.

Source of Data: Data were obtained from a study of the forecast enrollment figures.

Findings and Conclusions: The results of this study were presented to the administration of General Motors Institute for inclusion in the final plans for the Institute's Expansion Program for 1953.

1120. LORTZ, G. M. (Masters). *Occupational Training Needs of Industrial Draftsmen Based on Present Practices and Technics in Kansas City, Missouri.* Colorado State College of Education, 1936.

1121. LUCE, L. WINSTON (M.S.). *Common Errors in Drafting Form.* Iowa State College, 1931. 32 p.

An examination of 240 drafting plates made by junior and senior high school pupils to determine the kind and frequency of errors in form. A graphical summary of the errors is presented.

1122. MacKELLAR, LYLE A. *A Summarization of Selected Theses Concerned With Courses of Study For Mechanical Drafting.* M.Ed., 1955, Wayne University. 45 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To collect, report, and evaluate the findings of several investigators relative to courses of study for mechanical drafting.

Source of Data: Date were obtained from ten other studies which have been made concerning courses of study for high school mechanical drafting.

Findings and Conclusions: Thirteen units of learning should be included in a course of study for the first year of high school mechanical drafting. Eleven units of learning should be included in the advanced course of mechanical drafting for high school students. The learning units which were adopted after a review of textbooks and other materials were little different from those which were adopted after surveys were made of students, parents, employers, and draftsmen or technicians in the field. This would indicate that the fundamental elements of drafting have become well established.

1123. MANOCK, JAMES CLIFTON. *Implications for the Secondary School Curriculum Revealed by a Survey of Draftsmen in Industry.* M.S., 1951, Iowa State College. 55 p. Library, Iowa State College, Ames.

Purpose: To ascertain the influence which local industries exert on the objectives of a mechanical drawing course.

Source of Data: Data were collected by questionnaires from 175 chief draftsmen of California industries.

Findings and Conclusions: The results confirmed the value of all of the common techniques taught in drafting courses. In addition, the following were indicated as necessary in certain jobs: pictorial sketching, shading, analytical geometry, physics, perspective, oblique projection, surface development, proportions, pantographs, photostat.

1124. MEDLAR, D. MILTON (Masters). *An Orientation Course in Industrial Drawing Based on Industrial Needs.* Miami (Ohio) University, 1946.

1125. MOREHART, JACK DUANE. *The Development of a Mechanical Drawing Curriculum For Canton McKinley High School.* M.A., 1953, The Ohio State University. 88 p. Library, The Ohio State University, Columbus.

Purpose: To develop a mechical drawing curriculum for grades 9 and 10 at Canton McKinley High School.

Source of Data: Data were obtained from a study of selected industries in Canton and surrounding communities to ascertain their needs and uses of the different types of mechanical drawing.

Findings and Conclusions: The data received were analyzed and used as a basis for the development of the drawing curriculum.

1126. MUDGETT, ALBERT G. *Visual Aids for Intersection Problems in Orthographic Projection.* M. A., University of Minnesota, 1948. 236 p.

Graphic representations, with explanations of the theory and solution of some intersection problems in orthographic projection for visual aid purposes.

1127. **MYERS, NOEL T.** (M.S.). *The Problem and a Method for Functional Design in Industrial Education.* The Stout Institute, 1944. 69 p.

From the opinions of thirty design teachers throughout the United States, the author has set up, defined, and illustrated basic principles of design. The study is confined to functional design and does not include color theory.

1128. **PALMER, LEWIS G.** *Visual Aids for Orthographic and Auxiliary Projection.* M.A., University of Minnesota, 1947. 186 p.

A study of graphic representations with explanations of theory and solution of problems in orthographic and auxiliary projection, with suggestions of visual aids.

1128. **PAOLUCCI, THOMAS D.** (M.Ed.). *The Values of Mechanical Drawing in the High School Program.* University of Buffalo, 1946. 115 p.

An attempt to explore the values contributed to the high school pupil through the study of mechanical drawing. Emphasis is on the scope of this subject and its values in related school activities.

1130. **PETERSON, R. A.** (M.S.). *Machine Drawing Practices—An Analysis of the Practices and Methods Used in Machine Drawing in the Racine, Wisconsin, School for Vocational and Adult Education.* The Stout Institute, 1939. 88 p.

An analysis of questionnaire surveys sent to forty-eight draftsmen and engineers in Racine, Wisconsin, to determine accepted industrial drafting practices. These findings are listed to serve as a guide for setting up vocational school machine drawing courses.

1131. **PETWAY, PATTIE** (M.A.). *Related Information to Mechanical Drawing.* George Peabody College, 1935. 105 p.

A compilation of related information that may be used in any general course of study in mechanical drawing. It includes a study of the need, application, and analysis of related information sheets in mechanical drawing.

1132. **RADFORD, STANLEY SHUGARTS.** *A Survey of Trade Drafting Curricula and Classroom Methods in Representative Smith-Hughes Trade and Vocational Schools of the United States.* M.A., University of Michigan, 1934. 196 p.

A study of trade drafting curricula, teaching methods, instructional material, and guidance implications in vocational high schools. Practically all schools examined are using individual job or information sheets supplemented by lectures on theory as the need arises.

1133. **RALSTROM, STIG EMIL** (M.E.). *An Analysis and Evaluation of the Detroit Drafting Course in Projections, Developments and Intersections.* Wayne University, 1949. Published: Wayne University, 1949. 169 p.

An analysis and evaluation of the instructional units for the Detroit High School drafting course in the geometry of drawing. The course provided the theory, basis, and foundation for the high school drafting curriculum.

1134. **SCOTT W. A.** (M.S.). *A Proposed Course of Study in Mechanical Drawing to Suit Vocational School Needs.* Colorado Agricultural & Mechanical College, 1931. 100 p.

A series of drawings and instructional sheets in mechanical drawing for first-year classes. The course of study includes use of equipment, drawing techniques, and theory of orthographic projection.

1135. **STURTEVANT, WALTER W.** (M.A.). *Course Content in Mechanical Drawing.* University of Minnesota, 1934. 68 p.

An analysis of working drawings in industry to provide the industrial arts teacher with specific fundamentals that should be stressed in his drawing courses. It includes the study of 2,000 drawings collected from thirty-six firms.

1136. **SWANSON, ELMER L.** *Drawing Concepts.* M.A., University of Minnesota, 1948. 100 p.

A study of the relative difficulty and frequency of presentation of drawing concepts as indicated in selected textbooks; listing and evaluation.

1137. **TAYLOR, ROBERT A.** *A Trade Preparatory Course in Machine Drafting for Chattanooga, Tennes-

see. M.S., 1949, The University of Tennessee. 159 p. Library, University of Tennessee, Knoxville.

Purpose: To prepare a unit course of study, based on the needs of the industries of Chattanooga, preparing students to make an effective entrance in the machine drafting trade.

Source of Data: A study was made of the leading textbooks on drafting; the leading trade, technical, and vocational schools courses of study; and the report of the drafting committee on curriculum building for Tennessee. Questionnaires were sent to leading engineers and draftsmen in the Chattanooga area to determine their reaction to a list of topics and content units to be included.

Findings and Conclusions: Ten main divisions of the course were determined by majority opinions of engineers and draftsmen. There were 93 problems selected to be included in the units of the course in machine drafting for Kirkman Vocational High School in Chattanooga. These were arranged in sequence based upon the amount of trade theory involved, the number of manipulative operations, and the complexity of the plate. The appendix contains information sheets and assignment sheets for typical units in the course together with a listing of the entire series.

1138. TEEPLE, R. B. (M.Ed.). *Mechanical Drawing Courses and Drafting Room Standards for the Henry Ford Trade School.* Wayne University, 1935. 66 p.

The presentation of a four year course of study for the Henry Ford Trade School with the correlation of Ford Motor Company standards.

1139. THATCHER, DON E. (Masters). *A Drawing and Design Program for Industrial Arts.* Ohio State University, 1942.

1140. TRAUM, EMIL F. *Drafting for the Detroit Intermediate Schools.* M.Ed., 1949, Wayne University. 75 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain requirements for a first semester course in drafting at the junior high school level.

Source of Data: Data were obtained from drafting textbooks and from the Detroit intermediate school drafting teachers' committee.

Findings and Conclusions: There should be orientation for the beginning drafting student. The drafting rules as established by the American Standards Association should be used in teaching beginning drafting.

1141. VAN OOT, JAMES (M.S. in Ed.). *Mechanical Drawing for the Junior High School.* Cornell University, 1946.

1142. WHITNEY, DONALD T. *Blue-Print Reading.* M.A., University of Minnesota, 1943. 52 p.

A detailed analysis of 838 working drawings secured from industries in Adrian, Mich., for the purpose of identifying instructional units for school courses.

1143. WILKINSON, W. J. (Masters). *A Survey of a Selected Technical School to Determine the Expected or Desired Mechanical Drawing Abilities of New Students.* University of Pennsylvania, c. 1935–47.

1144. WOODS, BEULAH B. (Masters). *A Study of High School Architectural Drawing.* University of Southern California, 1932.

Electricity

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1145. ADAMS, ROBERT WAYNE. *Educational Needs of Residents of Electrified Farms Concerning the Use of Electricity.* Ed.D., University of Missouri, 1947. 239 p.

A study of the use of electricity on the farm and the need for training in applied electricity, with suggestions as to ways and means of providing this training.

1146. ANDERSON, ELTON P. *Electricity for the Senior High School.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 77 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain what operations and information units should be included in industrial arts courses in electricity for the Columbia High School, Richland, Washington.

Source of Data: Data were secured by a questionnaire sent to 18 Washington high schools offering electricity and by interviews with educators and representatives of labor and industry.

Findings and Conclusions: Areas of activity and instruction in electricity should include: magnetism, current electricity, electrical circuits, measuring units and instruments, batteries and dry cells, heat, power and light, wiring and installation, motors and generators, transformers, coils, solenoids, condensers and rectifiers, and history, uses, and opportunities in electricity and communication.

1147. ASPINWALL, JUDSON (M.A.). *A Syllabus on Electricity for the Industrial Arts Curriculum in our Secondary Schools.* Stanford University, 1935. 175 p.

An analysis of the problems of teaching electricity in the industrial arts curriculum from grade seven through fourteen.

1148. BAKER, LAWRENCE LYLE. *Current Practices of Teaching Electricity in the Industrial Arts Programs in the Secondary Schools of Texas.* M. S., 1954, North Texas State College. 92 p. Library, North Texas State College, Denton.

Purpose: To ascertain current methods, practices, and techniques used in teaching electricity in the industrial arts programs in the secondary schools of Texas.

Source of Data: Data were secured from bulletins, study guides, books, and a questionnaire.

Findings and Conclusions: Methods, practices, and techniques used in teaching electricity vary greatly. A large majority of the 170 teachers who participated in the study had not received formal preparation in electricity. Few facilities were adequate for the teaching of electricity in the State of Texas.

1149. BEASLEY, PAUL HARLOW (M. A.). *Related Information Basic to Electrical Work.* George Peabody College, 1938. 162 p.

The preparation of forty-six instruction sheets on the treatment of basic problems in elementary electricity. Data is based on a review and an analysis of printed material in this subject.

1150. BIVINS, EDDIE BYRON. *Electricity: A Content Study for Industrial Arts.* M.A., 1955, The Ohio State University. 97 p. Library, The Ohio State University, Columbus.

Purpose: To integrate into the curriculum some recently developed concepts and materials in the field of industrial arts electricity.

Source of Data: Data were obtained through an analysis of available literature and correspondence with manufacturers and research bureaus.

Findings and Conclusions: Electricity, if omitted from the industrial arts program, leaves a wide gap in the students' understanding of their industrial environment that cannot be adequately filled in any other place in the school's program. Teacher-training institutions should design their industrial arts programs to include fundamentals of electricity.

1151. BIVANS, IRA. *A Course in Radio For Senior High Schools.* M.S., Iowa State College, 1939. 65 p.

A course of study for senior high school radio work based on data gathered from shop teachers.

1152. BOWLING, JEROME, Jr. *An Analysis of Radio Technicians' Training Needs.* M. S., 1950, Louisiana State University. 191 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine the need for a trade extension training program for persons employed in radio servicing in the parish of East Baton Rouge, Louisiana, and to develop a proposed outline for a 2-year course of study in radio servicing at the trade school level suitable for use in radio trade extension training programs.

Source of data: Normative survey method, employing the personal interview, questionnaire, and survey analysis techniques; a review of periodical literature, latest edition of good textbooks, manufacturers' technical manuals, educational divisions of the more important radio and electronics equipment manufacturers, and new trade and industrial education publications. Thirty-three radio service companies cooperated in this study.

Findings and Conclusions: An outline of a 2-year course of study in 19 parts was drawn up. The parts may be used in short unit courses or mastered one after the other until completed. The course is directed to the radio service technicians who are not advanced enough to study the subject on an engineering level. Sixty percent of the hours were allotted to classroom work and 40 percent to shop or manipulative practice.

1153. **BRANDSTATT, LAVERNE** (M. S.) *The Status of Practical Electricity in the High Schools of Northern California: A Proposed Program.* Oregon State College, 1939. 53 p.

A suggested course of study with instruction sheets for selected operations and projects in practical electricity, based upon a survey of selected schools and a critical analysis of the field work represented.

1154. **BRIGGS, E.** (Masters). *What Factors Should Determine the Content of Courses in Shop and Related Subjects in the Industrial Electrical Curriculum at the Gratz Senior High School.* University of Pennsylvania, c. 1935–47.

1155. **BURKHART, CHARLES F.** (Masters). *Construction Projects for a Unit on Electricity and Magnetism.* Ohio State University, 1941.

1156. **BYRD, HOYT.** *A Study to Ascertain the Desirability of Electricity as a Phase of Industrial Arts in the Merkel High School.* M.S., 1951, North Texas State College. 49 p. Library, North Texas State College, Denton.

Purpose: To learn the desirability of adding electricity to the industrial arts curriculum in the Merkel High School, Merkel, Texas.

Source of Data: Data were secured from literature and a questionnaire.

Findings and Conclusions: The students and parents believed that one or more courses in electricity should be included in the curriculum of the school.

1157. **BYROM, J. MARVIN** (M. S.). *Industrial Aids for Teaching Electricity in High School Industrial Arts Course.* University of Tennessee, 1940. 105 p.

An analysis of data from students who had taken electrical courses to determine their preference in the electrical classes. Methods are suggested to improve shop instruction.

1158. **CRILEY, CLIFFORD F.** (M. S.). *A Job Analysis of the Electrical Wireman's Trade for Teaching Purposes.* University of Kansas, 1930. 82 p.

An attempt to develop a course of study that would aid student progress in learning the electrician's trade. The series of instruction sheets pertaining to the trade includes operation, information, job, and check sheets for cleat work, wiremolding, conduit, switch connections, joints, etc.

1159. **CURL, FLOYD T.** (M. S.). *A Reading Vocabulary in Electricity Based on an Analysis of the Content of Electricity Textbooks.* Iowa State College, 1937. 99 p.

An investigation of a running list of 112,351 words in an effort to standardize the terminology of electricity and to aid in determining a minimum essential vocabulary to be used by pupils in electrical classes.

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1160. **DECK, WILLIAM LUTHER.** *A Resource Research in Electricity.* Ph.D., 1955, The Ohio State University. 250 p. Library, The Ohio State University, Columbus.

Purpose: To develop resource units in electricity suitable for use in the industrial arts curriculum from elementary to adult and service levels as well as implications for teacher education.

Source of Data: Data were obtained from various library resources.

Findings and Conclusions: Electricity and electronics affect the lives of every person in the United States. Even so, not more than 10 per cent of the industrial arts teachers in the United States have received training in this subject and fewer than 3 per cent offer it as a program of realistic proportions. Electricity must be taught at all levels, elementary through adult and from magnetism through electronics, by the conclusion of the secondary school. Teacher education programs need to offer better programs than at present. Experimentation and developmental work need to be encouraged as well as literature in the field. Refresher and in-service training programs need to be offered to keep abreast of trends and help fill the present void.

1161. **DOUGLASS, VERNON J.** (Masters). *The Development of a Course of Study for the Electrician's Trade.* Iowa State College, 1944.

1162. **DRAZEK, STANLEY, JOSEPH** (M. A.). *Source Unit for Industrial Arts Electricity and Electronics.* University of Maryland, 1947. 237 p.

An analytical description of a method to broaden the electricity-electronics course offerings at the industrial arts level. The author surveyed the electrical industries and prepared instructional material from the various phases of these industries.

1163. ENSOR, MARSHALL HAMILTON. *Teaching Radio by Radio.* M.S. in Ind. Ed., Kansas State Teachers College, 1940. 168 p.

The development and operation of a course in continental code instruction by radio.

1164. FISHER, GILBERT W. (Masters). *A Course of Study in Practical Electrics for High School Industrial Arts.* Stanford University, 1941.

1165. FLINT, EARL E. (M.A.). *An Industrial Arts Unit in Electricity for the Senior High School.* Miami University, Oxford, Ohio, 1940. 87 p.

A survey based upon a series of twenty-five personal interviews with a representative group of men in electric and allied industries. Their reaction to a series of questions covering generation, transportation, and the consumption phases of electricity were analyzed and incorporated into a proposed teaching unit. A jury of industrial arts educators were selected to evaluate the teaching plan.

1166. FRANCIS, GEORGE H. *A Study of the Comparative Effectiveness of Two Teaching Procedures in Electricity.* M.S., 1954, Stout State College. 77 p. Library, Stout State College, Menomonie, Wis.

Purpose: To evaluate the relative values of the manipulative exercise as compared to the problem-solving exercise procedure in teaching and learning the fundamental concepts of electricity.

Source of Data: Data were obtained from a controlled group experiment involving 18 students enrolled in electricity at the Stout State College. Statistical analysis of the data collected was the basis for conclusions drawn.

Findings and Conclusions: Objective tests were developed, based on the objectives set up for this phase of electricity and the results of these tests served in the application of statistical methods of interpretation.

1167. GAMBLE, MILTON ERNEST (M.S.). *The Use of the Electrostatic Machine in Teaching Electricity.* Purdue University, 1938. 61 p.

The development of methods for teaching electric charges, electric field and lines of force, and electrification. Includes a description of sixteen experiments which were conducted for this study.

1168. GREATHOUSE, C. S. *Electricity in the Rural Areas of North Texas.* M.S., 1949, North Texas State College. 63 p. Library, North Texas State College, Denton.

Purpose: To ascertain whether instruction in the use of electricity and electrical equipment was needed and wanted by the families living on electrified farms in the North Texas area, and whether the public high schools include this instruction as part of their curricula.

Source of data: A survey was made of 10 North Texas counties through personal interviews with 205 men and women living on electrified farms and by submitting questionnaires to 200 high school superintendents, high school principals, special subjects teachers, and county agents of the counties surveyed.

Findings and conclusions: This study shows three things: A precedent for the expenditure of public funds to teach electricity in our public school systems has already been established; the rural families living on electrified farms in North Texas want instruction of this type given to the boys and girls in their communities; and both the rural people and the professional people of North Texas area believe that instruction dealing with the use of electricity and electrical equipment should be included as a part of the curricula of our public high schools.

1169. GRUDICHAK, STEPHEN J. *A Survey of Industrial Arts Radio Course Content Taught in Secondary Schools.* M.S., 1950, The Stout Institute. 80 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To identify the elements that are included in radio course content analyzed under the following headings: Learning and doing units that are taught on the beginning, intermediate, and advanced levels; related information units, such as technical, general, and guidance units; ocupational analysis; position of the instructor; and organization of the shop used for instruction.

Source of data: Two methods employed in this study were preliminary inquiry, and normative survey with a questionnaire.

Findings and conclusions: The course information included the following material: Course title, course instructor, grade levels of required course, grade levels of elective course, elective objectives, prerequisites of the course, course length, additional courses in radio; amount of time for a period of instruction, type of shop, average number of students per class, level of instruction, co-educational instruction, and textbooks used. The subject matter dealt with four phases of instruction, technical information, general information, guidance information, and projects. Technical information was concerned with the various instructional elements, history of communication, wave motion, direct-current theory, aerial-ground system, tuning system, alternating-current theory, detector, reproducer, vacuum tubes, power supply, volume control, tone control, and superheterodyne receiver. The general information consisted of seventeen instructional units as presented on the questionnaire; eight additional instructional units were contributed by the respondents. Two additional instruction units for the teaching of guidance information were added by the respondents to the original list of ten units. The study may be used as a guide for the construction of courses of study, for initiation of a course in radio, for evaluation of a present course in terms of what others are teaching, for evidence to administrators to show the existence of radio course, and as a guide to show the extent of present radio courses. A list of opportunities for further research conclude the recommendations.

1170. HACKMAN, GEORGE M. (M.S.). *Teaching Electricity on the Junior High School Level.* University of Tennessee, 1935. 125 p.

An analytical description of the course content of an electrical course developed in 1935 as an industrial arts subject for junior high school students. An historical treatment of the organization of industrial arts in the Knoxville, Tennessee, program is included.

1171. HARRINGTON, JAMES S. *Some Problems Encountered In Establishing An Electricity Program at the Junior High School Level.* M.A., 1954, San Diego State College. 107 p. Library, San Diego State College, San Diego, California.

Purpose: To identify and to offer suggestions to help overcome some of the problems encountered by the beginning teacher on his first assignment.

Source of data: Data were secured through magazines and periodicals, and from various bulletins, guides, and manuals provided by cities for their beginning teachers.

Findings and conclusions: Many problems are associated with adjustments of a personal nature to local interpretations and philosophies. Others depend upon fiscal allowances, space limitations, availability of equipment and supplies, or the program to be developed. The successful solution of difficult situations depends upon the individual planning for them and applying logical problem solving techniques.

1172. HAYES, WALTER OWEN (M.S.). *Recommended Courses in Electricity for a Technical High School Based Upon a Survey Made in Des Moines.* Iowa State College, 1947. 63 p.

A survey of electrical tradesmen to discover the important elements to be included in a training program of electricity.

1173. HERRING, TOD HAMILTON. *Electroplating in Industrial Arts Classes.* M.A., 1952, The Ohio State University. 87 p. Library, The Ohio State University, Columbus.

Purpose: To explore the possibility of including electroplating in the industrial arts curriculum.

Source of data: Data were obtained by setting up an exemplary unit. Experiments were carried on with the different electroplating processes to develop a body of knowledge suitable for use in industrial arts classes.

Findings and conclusions: The formulas and procedures reported are concerned with copper, nickel, chromium, and cadmium plating. Information and operation sheets covering the following topics are included: Electroplating, Metal Cleaning and Preparation, Copper Plating, Nickel Plating, Chrome Plating, Cadmium Plating. Suggested problems and experiences are listed as an aid in developing a unit on electroplating in industrial arts classes. Electroplating can be carried out successfully in a high school industrial arts laboratory.

1174. HOBBS, WALTER R. *A Course in Radio Troubleshooting for High School Students.* M.S., 1949, Ohio State University. 127 p. Education Library, Ohio State University, Columbus.

Purpose: To teach radio troubleshooting for high school students.

Source of Data: Made a study of the existing material in this field and developed a course of study.

Findings and Conclusions: Evidence has been presented which tends to prove that the science of electronics is becoming an important factor in individual, group, and community living. Electronics as a subject should be given a place in educational programs.

1175. HOBSON, RODNEY D. *General Information for Elementary Electricity.* M.A., 1949, University of Minnesota. 119 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To compile general information in elementary electricity.

Source of Data: Data were obtained from references.

Findings and Conclusions: Instruction sheets were prepared to cover the units of instruction.

1176. JAUTZ, GILBERT J. (M.S.). *Plan for Teaching the Testing of Direct Current Shunt Motors.* Colorado Agricultural & Mechanical College, 1939. 64 p.

A course of study including objectives, shop instructions, instruction sheets, and tests.

1177. JOHNSON, CARL D. (M.A.). *A Study of the General Educational Possibilities of Junior High School Electrical Shop Work.* Ohio State University, 1935. 233 p.

A study of elementary work with the objective of making suggestions for the selection and presentation of electrical shop work on the junior high school level. It includes the objectives, aims, and opinions expressed by authors and editors of general science, physics, and industrial arts textbooks.

1178. JOHNSON, RALPH OLIVER. *Organization of an Area Radio-Frequency Modulation Station for School Broadcasts.* M.Ed., 1949, Colorado Agricultural and Mechanical College. 92 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To present a plan for the organization of an area FM radio station for school broadcasts.

Source of Data: Review of literature and interviews with experts.

Findings and Conclusions: Uses are indicated and a plan for organizing an FM station is presented.

1179. JOHNSTON, JOHN L. *A Proposed Curriculum For Radio Technicians with Special Reference to the Vocational Program at Kansas State Teachers College, Pittsburg.* M.S., 1951, Kansas State Teachers College. 101 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a curriculum for vocational radio technicians to meet present day needs.

Source of Data: Data were obtained from books, magazines, bulletins, and opinions expressed by radio technicians actively engaged in the field of radio servicing.

Findings and Conclusions: The course developed includes the following areas: fundamentals of radio, practical electricity, applied electrical mathematics, electronic tubes and associated circuits, applied electrical mathematics II, radio test equipment and circuit analysis, radio shop practice and business management, radio servicing practice, fundamentals of television, and television servicing.

1180. KECK, ROBERT M. (Masters). *A Study of How and Where Electricity Is Used in Industry with Suggestions for Selecting Content.* Ohio State University, 1938.

1181. KROGSTAD, ROLAND J. *A Suggested Plan for the Preparation of a Resource Unit for General Electricity in Wisconsin Schools.* M.S., 1952, Stout State College. 172 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To present a plan, consisting of a questionnaire, suggestions, and materials which may be used as aids in the preparation of a general electricity resource unit.

Source of Data: Data were obtained from a review of selected texts, references, courses of study, and state bulletins.

Findings and Conclusions: The trade and job analysis technique was used in identifying instructional content in general electricity, which was grouped according to the following divisions: fundamentals of electricity, heating and lighting, rotary power, chemical effect, communications, residential wiring, and electronics.

1182. LINCOLN, ROBERT T. *Electrical Drafting Circuit Analysis.* M.S. in Ed., 1950, Cornell University. 48 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To present the important standard electrical concepts of circuit diagrams.

Source of Data: Library research.

Findings and Conclusions: Information and problems are presented concerning use of electrical symbols, terms, and standards in analyzing electrical circuits related to the power field. Material is also presented for planning courses of study for electrical drafting.

1183. LINTECUM, ALLEN BERTRAM. *REA Service as a Source of Instructional Units.* M.S. in Ind.Ed., Kansas State Teachers College, 1942. 32 p.

A series of skill and knowledge units are included in the report. An account of the skill and knowledge about electricity needed by rural users of electricity.

1184. MANNE, ANTHONY L. *Radio as an Industrial Arts Subject in the High School General Shop.* M.S., 1951, Oklahoma Agricultural and Mechanical College. 57 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To organize the necessary information for a radio course to be taught as an industrial arts subject in the high school general shop.

Source of Data: Data were obtained through a review of technical literature.

Findings and Conclusions: The great influence of radio today requires that students have a basic understanding of its operation. A radio course can fulfill the objectives of general education and industrial arts education. This course can be closely correlated with physical science courses.

1185. MATALA, RAYMOND E. *The Conversion of War Surplus Electrical Material to Industrial Arts Purposes.* M.A., 1950, University of Minnesota. 112 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To aid industrial arts teachers in their attempts to adapt and use surplus electrical equipment.

Source of Data: Data were obtained from an examination of equipment, and from published materials.

Findings and Conclusions: Much war surplus electrical equipment can be converted to industrial arts purposes.

1186. MAXHAM, KENNETH EDWARD (Masters). *Constructing a Course of Training for Electrical Trade Workers.* University of Wisconsin, 1938.

1187. MAY, EDITH KING (M.A.). *High School Mathematics for Vocational Students of Electricity.* University of Texas, 1941. 98 p.

A course of study in mathematics related to the electrical trades, based upon an analysis of need and student background.

1188. McCOY, CHARLES F. (M.S.). *The Value of Pupil Notebooks in the Teaching of Electricity in the Junior High School.* Iowa State College, 1934. 68 p.

A study to find the value of pupil notebooks as an aid in the retention of information by pupils in electrical classes in the Clinton Junior High School, Clinton, Iowa. Lesson sheets were used and are contained in the thesis along with job sheets.

1189. McHENRY, LEROY NOBLE (Masters). *Content of Electricity for Industrial Arts, with Special Reference to the Applications of Electricity in the Industries and Occupations.* Ohio State University, 1937.

1190. MIDDLETON, DONALD SALISBURY. *A Course in Radiotelephony for Colorado Vocational Schools,* M.Ed., 1950, Colorado Agricultural and Mechanical College. 73 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To obtain adequate information to develop a course in radiotelephony to enable Colorado vocational radio students to pass the Federal examination.

Source of Data: Sources of data were Colorado vocational radio instructors, recent examinees of the radiotelephone first class operator examination, the Denver radio inspector of the FCC, and literature. Two years covered.

Findings and Conclusions: The implications of the study were that emphasis should be given to the revised Federal study guide, certain deleted questions from the 1939 study guide, certain unusual questions recently encountered, a general radio and electricity mathematics course, the slide rule, and radio related study in physics. As a result of this study, it was indicated that while the revised 1948 Federal study guide was the best source book for information, it only indicated the approximate scope of the examination.

1191. PETERSON, DONALD MARVIN. *A Beginner's Course in Electricity.* M.A., 1955, University of Minnesota. 162 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare a guide book for teaching electricity at Phillips Junior High School, Minneapolis, Minnesota.

Source of Data: Data were obtained from pupil cumulative record cards which were used to ascertain home conditions, attendance patterns, and achievement and ability levels for a group of forty-eight enrollees for this subject for the year 1954–1955. Literature was consulted in the study of accepted lists of educational objectives.

Findings and Conclusions: Of the forty-eight boys involved in the study, 35.4 per cent came from broken homes; the families had moved quite often, none of the parents were in professional or managerial occupations; the group average I.Q. was 98.2; school records indicated poor attendance and under-achievement. Course objectives were assigned to teaching units, and two of these units were developed fully. A method of class organization was also developed with a full description of each duty to be delegated to a student.

1192. PORTER, CHARLES BADDELEY. *A Method for Selecting Course Content for Beginning Industrial Arts Electricity.* M.S., 1950, Illinois State Normal University. 81 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the instruction units that should be included in a course of study in beginning industrial arts electricity.

Source of Data: Data were obtained from books, pamphlets, periodical literature and an analysis of electrical appliances and equipment.

Findings and Conclusions: The beginning course in industrial arts electricity should include: cleaning and lubricating electric motors; replacing cords, plugs, bulbs, batteries, tubes; installation and maintenance of homewiring equipment and supplies; and purchase of electrical equipment and supplies for home use.

1193. PRICE, ARLAND. *A Course of Study for Beginning Electrical Work.* M.S., 1952, Oklahoma Agricultural and Mechanical College. 72 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To design a course of study in beginning electricity to serve in an exploratory and general education capacity.

Source of Data: Data were obtained from new textbooks, experience, and other courses of study.

Findings and Conclusions: A selected list of modern electrical books is given.

1194. ROCKWELL, WILLIS A. *Occupational Information in Electricity.* M.S., 1952, Stout State College. 83 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain the extent of the occupational information offerings in the field of electricity.

Source of Data: Data were obtained by sending questionnaires to fifty-eight schools.

Findings and Conclusions: There is a definite need in the State of Wisconsin for more occupational information to be offered to adults. Further surveys of the state vocational schools are recommended with the expressed purpose of improving the overall picture of the offerings of the schools of vocational and adult education.

1195. SCHUMACHER, C. EDWARD. *To Investigate the Status of Industrial Arts Electricity in the City, Exempted Village and County Schools of Northwestern Ohio.* M.S., 1950, Bowling Green State University. 87 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: None reported.

Source of Data: Review of recent literature and survey by questionnaire method.

Findings and Conclusions: Many schools are not meeting the minimum State requirements for first grade schools of Ohio by failing to offer a course in industrial arts electricity. Only 44.3 percent of the schools of Northwestern Ohio are meeting this requirement. Many pupils do not have the opportunity or privilege of making contact with industrial arts electricity, especially the girls who need this subject as much as the boys. Industrial arts electricity courses are too short in length and are not given the same consideration in time and equipment as some other industrial arts courses. Industrial arts electricity is very well suited for the general type of shop and can be easily integrated with other industrial arts courses. Many factors hinder the offering of industrial arts electricity. The 3 most common factors are lack of facilities, an understanding of electricity received in other courses, and lack of time. This condition indicates that reorganization of school curriculums would be advisable.

1196. SHUTTS, DONALD MERL. *Curriculum Development in the Electrical Field for Rural Areas—Technical Institute Level.* M.S. in Ed., 1948, Cornell University. 88 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To develop a curriculum in the electrical field for rural areas.

Source of Data: A survey was made of electricians from 11 representative upstate areas. The question asked was: "What type of electrical work do you do?" Next, activities were selected which would include these jobs. The activities were then analyzed to determine the operations involved and the proper courses and sequence of courses of instruction.

Findings and Conclusions: The activities selected were: Residential wiring, industrial wiring, motors and control, mechanical repairs, appliance, installation and repair, and testing and trouble shooting.

1197. SMITH, JAMES ELLIOT (Masters). *Related Mathematics for the Electrical Trades.* Pennsylvania State College, 1935.

1198. SMITH, JOHN E. (M.S.). *Related Mathematics for the Electrical Trades.* Pennsylvania State College, 1930. 81 p.

A study of the mathematics used in vocational education with special emphasis on the mathematics related to the electrical trades. Courses of study, text and reference books are analyzed.

1199. STRANGE, GEORGE S. (Masters). *Electricity in the Eighth Grade Curriculum.* Ohio State University, 1937.

1200. SVENDSEN, ETHAN A. T. *Junior High School General Electricity,* M. A., University of Minnesota, 1947. 109 p.

A course of study in general electricity for the junior high schools—applications to home, industry, and communication.

1201. WEAVER, ROGER JACOB (M. S.) *Electricity for the Junior High School General Shop.* Indiana University, 1941. 182 p.

A study which attempts to provide subject matter in electricity for pupils of junior high school ages. It includes work of a practical nature, and deals with the knowledge and practices in relation to the electricity of everyday life which should be possessed by the average man.

1202. WEBSTER, SAM. *An Electricity and Electronics Shop for the Industrial-Vocational-Technical School.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 71 p.

A proposal for an electrical and electronics program for Central State College, including shop plans, equipment lists, and courses of study.

1203. WEINSTOCK, CLARENCE (Masters), *Status of Construction in Electricity in the Secondary Schools of California.* University of Southern California, 1931.

1204. WRIGHT, SIDNEY E. (M. A.). *Junior High School Electricity—Selection of Teaching Units and Their Ranking as Based upon Importance, Order of Presentation, Difficulty and Necessary Drill.* University of Minnesota, 1935. 124 p.

An analysis of teaching units (jobs, operations, experiments, demonstrations) for junior high school electricity courses. The study is limited to manipulative units, and the data has been evaluated by a group of junior high school electricity teachers.

1205. WETZEL, BENNIE F. (M. S.). *The Reorganization of Junior High School Courses in Electricity.* University of Southern California, 1936. 175 p.

A discussion of the reorganization of the subject matter of electrical courses justifying the changes on the basis of the aims and objectives in a changing world.

Engines

1206. ALBERTY, LUMAN H. (Masters). *Determination of Related Subject Matter for Auto Trade Classes.* University of Wisconsin, 1931.

1207. ALDRICH, LESLIE LEROY. *A Study of Automotive Mechanics Education with Suggestions for Improving Industrial Arts Automotive Programs in Oregon Secondary Schools.* M.S., 1955, Oregon State College. 93 p. Library, Oregon State College, Corvallis.

Purpose: To examine secondary school automotive laboratories and instruction in Oregon, and to formulate a course organization for teaching industrial arts auto mechanics.

Source of Data: Data were secured by a questionnaire sent to Oregon secondary schools and visits to various automotive laboratories.

Findings and Conclusions: Automotive school programs are growing both nationally and in Oregon. It is suggested that an instructor organize his program into a beginning and an advanced program. The beginning program should be organized into units of study making use of instruction sheets. The advanced program should be organized to utilize "live" vehicles through actual shop repair work.

1208. ALTHOUSE, ANDREW DANIEL (M.A.). *Related Knowledge Required of the Automobile Service Mechanic.* Wayne University, 1936. 107 p.

Attempts to determine the knowledge necessary to become an automotive service specialist from a study of automobile maintenance manuals and various related areas of knowledge (mathematics, drafting, chemistry, physics, and metallurgy).

1209. BARRETT, KENNETH JOHN. *Driver Education Instruction for Industrial Arts Teachers in Minnesota.* M.Ed., 1951, Colorado Agricultural and Mechanical College. 73 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the need for instruction in driver education among industrial arts teachers of Minnesota.

Source of Data: Data were obtained from questionnaires sent to 116 Minnesota high school administrators and six Minnesota industrial arts teacher education institutions.

Findings and Conclusions: Most driver education in Minnesota could be carried on effectively by instructors of departments other than industrial arts. The program was most frequently the responsibility of the physical education department. There is little need to offer or require driver education in industrial arts teacher education programs.

1210. CARTER, J. STANLEY. *Diesel Mechanics: A Unit in Auto Mechanics Courses for Comprehensive High and Trade Schools.* M.Ed., 1953, Wayne University. 57 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To establish the validity of the need for training mechanics to repair diesel engines; to ascertain to what extent secondary vocational schools were participating in the training of diesel mechanics; and to find out if the essential elements of the diesel and auto mechanics trades were allied to the extent that they could be combined.

Source of Data: Data were obtained by investigation of pertinent literature and research studies and a questionnaire sent to schools offering diesel instruction on the secondary level throughout the continental United States, Puerto Rico, and Hawaii.

Findings and Conclusions: It was recommended that in cases where community needs justified, diesel instruction be included in the auto mechanics curriculums of secondary schools. A basic course outline is included. Specific recommendations were made relative to course content, cost, tools, equipment, and the physical plant.

1211. BELL, JOHN WALTER. *Suggested Standards For Tools and Equipment to be Used in High School Auto Mechanics Shops.* M.S. in Ind. Ed., Kansas State Teachers College, 1946. 193 p.

A report containing comprehensive lists of tools and equipment for auto mechanics shops on comparative basis.

1212. BOWERS, PAUL ROBERT (M.S.). *A Course of Study in "General Power Mechanics" for the Secondary Schools.* Oregon State College, 1937. 85 p.

A study of the development of a course of study in "General Power Mechanics" as a medium for the close correlation of social studies, science, and industrial arts. Develop-

ment and use of power through the ages, with its accompanying benefit to mankind, is the integrating element.

1213. CARGOL, LAWRENCE HEWITT, Sr. *A Proposed Automotive Engine Overhaul Course in Industrial Arts of a Unit Shop.* M.Ed., 1949, Agricultural and Mechanical College of Texas. 64 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: **To develop a course in automotive engine overhaul suitable for inclusion in the industrial arts program.**

Source of Data: **A survey was made of related literature to ascertain the needs of students. Similar studies and courses were analyzed to obtain the basic features of the proposed course.**

Findings and Conclusions: **A course of study in automotive engine overhaul for industrial arts was prepared.**

1214. CARLIN, LESLIE O. (M.A.). *Diesel in Secondary Education.* Colorado State College of Education, 1946. 111 p.

A complete course of study in Diesel engines for secondary schools based on current literature, teacher experiences, and available teaching aids.

1215. CARNEY, TRYIN FRANCIS (M.A.). *Automotive Electricity.* Ohio State University, 1938. 175 p.

A study of the operation and components of automotive electrical systems. It describes the electrical action of generators, starting, ignition, wiring, and accessory systems.

1216. DICKSON, JOHN G. (M.S.). *Tolerance and Clearance Practices of Auto Mechanic Instructors in the Field of Trade and Industry in California.* Colorado Agricultural & Mechanical College, 1935. 117 p.

A study of the practices of manufacturers of automobiles regarding tolerance and clearance on the working parts of a car. A master chart is developed and compared with the standards used in thirty-three schools in California.

1217. DOMINETTA, JAMES M. (M.S.). *Analysis of Auto Mechanic Textbooks to Determine A Reading Vocabulary for Students in Auto Mechanics Classes.* Iowa State College, 1936. 84 p.

An investigation covering 110,584 running words to determine the minimum essential vocabulary to be acquired by auto mechanics students in high school and to aid in standardizing terminology in auto mechanics.

1218. EVANCHO, MICHAEL (M.A.). *Determination of the Contents of a Mathematics Course for Auto Mechanics.* University of Pittsburgh, 1934. 37 p.

A study to determine what mathematics, and what other technical knowledge in terms of mathematics, should be taught to the boy in trade school.

1219. FRANKLIN, C. A. (Masters). *Study Content and Student Direction of Auto Mechanics.* Oklahoma A & M College, 1939.

1220. FROST, ELLERY H. (Masters). *The Activities of the Automobile Mechanic as a Basis for Curriculum Making.* University of Chicago, 1930.

1221. HARSHMAN, WILLIAM C. *Content for a Proposed First Semester Auto Mechanics Course in an Industrial Arts Program.* M. S., 1954, Purdue University. 29 p. Industrial Education Office, Purdue University, Lafayette, Indiana.

Purpose: **To select content for a first semester industrial arts auto mechanics course, and to organize a well rounded program in this area.**

Source of Data: **Data were secured through questionnaires sent to twenty-two Indiana auto mechanics instructors.**

Findings and Conclusions: **There is a big difference in physical shop layout and special equipment used in teaching auto mechanics. Interest in auto mechanics courses in the school shop seems to be very high for the manipulative procedures, but lower for the related information.**

1222. HARTMAN, HARRY V. *Organization and Content of Courses in Auto Mechanics for Junior and Senior High Schools.* M. S., Iowa State College, 1931. 73 p.

An analysis of courses in auto mechanics given at the junior and senior high school level.

1223. HEATWOLE, MILO J. *A Survey of Auto Mechanics Shops of Senior High School and Junior College Level in Kansas.* M. A., 1954, Kansas State Teachers College. 30 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain trends and advancements made in design and layout of auto mechanics shops in the larger schools of Kansas.

Source of Data: Data were obtained by questionnaire, visitation, and from literature on the subject.

Findings and Conclusions: Desirable features found were large working areas, use of fireproof building materials, floor drainage, circular wash basins, parking areas, facilities for evening classes, improved layout of equipment, more auxiliary rooms, better lighting, and installation of exhaust systems.

1224. HILL, JAMES McGRATH. *Visual Aids for Automotive Science.* M. A., 1950, Ohio State University. 68 p. Education Library, Ohio State University, Columbus.

Purpose: To explore the history of the automobile and its effect upon the technology which indicated implications for industrial arts and to justify and show the need for the use of visual aids in the area of automotive science.

Source of Data: Identify the importance of automotive science and the use of visual aids through a review and analysis of selected readings.

Findings and Conclusions: The implications which the automobile has for education makes it necessary that schools adopt the unit of automotive science in their industrial arts curriculum. If the goals of enlightened citizenship and understanding of our position in the society and culture are to be met, automotive science must be incorporated into the school's curriculum. The evolution of the automobile called attention to the need of automotive science. For better understanding, the technical aspects of automotive science requires the use of visual aids.

1225. HORTON, BURLEN L. *Automotives As Industrial Arts Content in the Secondary School.* M. A., 1953, Southwest Texas State Teachers College. 73 p. Library, Southwest Texas State Teachers College, San Marcos.

Purpose: To explain the importance of the automotive industry in an age of technology, and to suggest automotive content for industrial arts courses in the secondary school.

Source of Data: Data were secured by conferences and through the use of published materials.

Findings and Conclusions: The many uses of automotive devices suggests the desirability of including automotive studies in the school program. One way of doing this would be through the introduction of units of work in the areas of power and transportation in the industrial arts laboratory.

1226. HUGHES, ROBERT J., *Jr. The Methods of Eliminating Carbon Monoxide Gas from School Auto Mechanics Shops.* M. S. in Ind. Ed., 1949, Kansas State Teachers College. 57 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To study the methods used in eliminating carbon monoxide gas from garages; to propose a method or methods of eliminating this gas from school auto mechanics shops.

Source of Data: Surveyed the regulations of each State Department of Industrial Hygiene in the United States regarding carbon monoxide gas; surveyed 26 school auto mechanics shops of this area.

Findings and Conclusions: Methods which are acceptable and those which are not acceptable for the school shop are indicated, with recommendations of specific means to be used in avoiding the accumulation of carbon monoxide gas in school auto mechanics shops.

1227. HUMBARGER, SOLOMON WAINEWRIGHT (M. Ed.). *Development of a Practical Course in Internal Combustion Motors and Power Farm Equipment.* University of Colorado, 1940. 71 p.

A course of study in power farm equipment to meet the needs of a small rural Kansas community. Learning units are presented.

1228. JARVIS, DEE VINCENT. *Driver Education and Training in the State of Nebraska.* M.Ed., 1954, Colorado Agricultural and Mechanical College. 90 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To evaluate and make suggestions for improving the driver education and training program in the State of Nebraska.

Source of Data: Data were obtained from a review of the literature and questionnaires.

Findings and Conclusions: Trained drivers have a 5 per cent better traffic accident record and a 25 per cent better traffic violation record than untrained drivers. Errors and poor judgment of drivers are the major causes of accidents. Three types of driver education are offered: a comprehensive program consisting of classroom work and behind-the-wheel training; classroom work only; and classroom work integrated in another course.

1229. JENNINGS, ROYALSTON F. (M.A.). *Current Changes in Automotive Service Occupations.* University of Minnesota, 1932. 193 p.

A description of the trends and growth of automotive service in twenty Minneapolis repair shops—giving organization, nature, and operation of the general garage as well as the specialized shop. The study includes a two year course in auto repair work for senior high school classes, with increased vocational intent.

1230. JENSON, L. E. (M.S.). *A Study of the Training and Kinds of Instruction Materials Necessary for the Workers in the Automechanics Field to Become Competent Automotive Electricians.* The Stout Institute, 1941. 131 p.

A survey of thirty garage owners in Milwaukee, Wisconsin, to validate an automotive electricity course of study based on the needs of automotive electricians, and to determine the availability of necessary instructional material.

1231. JEPPSON, ERNEST C. *Procedure for Determining the Content of a Course of Study for Automobile Drivers.* M.S., Colorado Agricultural and Mechanical College, 1938.

A course of study for automobile drivers.

1232. KEENE, WADE HAMPTON (M.S.). *Auto Mechanics in the Industrial Arts Department of the Senior High School.* Oklahoma A & M College, 1934. 208 p.

Material for a course of study in auto mechanics, based on analysis, shop manuals, and textbooks available in 1934.

1233. KILPATRICK, JOSEPH JAY (M.S.) *Fundamental Factors in the Evolution of Non-Vocational Automobile Mechanics.* Oregon State College, 1939. 134 p.

An attempt to discover what should be included in a non-vocational automobile course in order to make it richer and more functional. The suggestion is made that emphasis be shifted to fundamental principles of buying and operating cars.

1234. LARSEN, HARRY W. *Farm Gas Engines and Tractors—A Suggested College Course.* M.A., University of Minnesota, 1947. 114 p.

A suggested course of study at the college level on up-to-date farm gas engines and tractors.

1235. LUTTER, THEODORE W. *Knowledge and Skills Most Likely to Make the Beginning Mechanic Employable.* M.Ed., 1952, Colorado Agricultural and Mechanical College. 88 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the knowledge and skills which a graduate of a trade preparatory school should possess in order to be readily employable as an auto mechanic.

Source of Data: Data were obtained from a comparative analysis of courses now in operation and a check sheet of characteristics that make good beginning employees in the automotive trade.

Findings and Conclusions: There are many jobs in the automotive field available to the beginning auto mechanic. The skills and technical knowledge foremen consider essential to the auto mechanic are listed.

1236. MAASS, RANDAL O. (M.S.). *A Detailed Course of Study for Auto Shop Science.* University of Southern California, 1936. 248 p.

A course of study complete with job sheets and instruction aids which aims to fulfill the requirements of a laboratory science course and an auto mechanics related technical knowledge course.

1237. MACOMBER, OLIVER WENDELL. *Evaluation of the Driver Education and Training Program—Porterville (California) Union High School.* M.S., 1955, Oregon State College. 78 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the status of driver education and to recommend improvements therein.

Source of data: Data were secured by questionnaires and a detailed study of programs.

Findings and conclusions: The Siebrech Driver Attitude Scale should be used, a dual control car with automatic transmission should be provided, and an elective course based on student age should be offered.

1238. McKEE, LYNN C. (Masters). *A Trade Training Curriculum in Automobile Mechanics for Senior High Schools.* Duke University, 1931.

1239. MOWBRAY, G. H. *Suggested Course in the Problems of Automobile Ownership.* M.S. in Ind. Ed., Kansas State Teachers College, 1939. 21 p.

A list of teaching units having to do with operation and care of the automobile.

1240. MURRAY, JOHN J. *A Proposed Plan for a Two-Year Course of Study in Auto Mechanics.* M.S., 1950, Louisiana State University. 303 p. Library, Louisiana State University, Baton Rouge.

Purpose: To propose a plan for a 2-year course of study in auto mechanics of 3 credit hours at the college level and to make this study applicable to an industrial education teacher trainer situation.

Source of data: An analysis of the current automotive service trade practice in the City of Baton Rouge, Louisiana, was the principal source of data in this study. Other important sources contributing data to this study are new trade and industrial publications, manufacturers' technical manuals, periodical literature, educational divisions of major manufacturing corporations, and new textbooks.

Findings and conclusions: Evaluation of the returns based upon service managers' estimates in terms of the volume of work contracted by their firms in each area of repair established the relative impertance of the major areas of repair in the following order: Engine repair (tune-up), brake system repair, chassis repair, electrical system repair, driving mechanism repair, fuel system repair, cooling system repair, body and fender work, automotive refinishing, and upholstery and glass work. The 2-year course of instruction is composed of the following sequence of instructional units: Engine repair (mechanical), fuel system repair, electrical system repair, cooling system repair, tune-up procedures, brake system repair, chassis repair, driving mechanism repair, body and fender work, automotive refinishing.

1241. POWERS, KENNETH R. *High School Industrial Arts Auto Mechanics.* M.Ed., 1950, Colorado Agricultural and Mechanical College. 67 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the instructional units for beginning high school industrial art auto mechanics.

Source of data: Questionnaires were sent to students in auto mechanics classes and to 100 owner-operators of automobiles.

Findings and conclusions: A set of objectives for high school industrial arts auto mechanics classes is suggested based on the needs of owner-operators of automobiles. In accordance with these objectives seven instructional units were offered; the automotive industry, major mechanical units of the automobile; program of owner-service; intelligent and economical operation; purchasing knowledge; safety; tools and equipment used in automotive service.

1242. ROBERTSON, JOHN CHAYTOR (Masters). *The Automobile: Its Development, Manufacture, Use, Effects, and Implications for Industrial Arts.* Ohio State University, 1940.

1243. RUDD, SAMUEL JUDSON. *Highway Auto Traffic Accidents and Their Causes With Special Reference to a High School Automotive Safety Program.* M.S. in Ind. Ed., Kansas State Teachers College, 1947. 66 p.

A study of highway accidents with a proposed course of study for safe driving.

1244. RUDIGER, ELMER R. *A Proposed Resource Unit in Auto Mechanics for Wisconsin Secondary Schools.* M.S., 1950, The Stout Institute. 138 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To develop a resource unit in auto mechanics for Wisconsin Secondary Schools.

Source of Data: The method of research employed involved a survey and an analysis of available literature on resource units, auto mechanics, and the objectives of industrial arts in secondary schools.

Findings and Conclusions: This resource unit includes a discussion of the importance of the automotive industry and the part it plays in modern industrial economy. In addition, the unit includes a list of proposed course objectives for auto mechanics with the possible behavior changes that may result from the realization of these aims. This unit makes several suggestions for possible student activities in automotive courses. These are listed in terms of jobs and informational topics pertaining to the operating, servicing, and repairing of the automobile. Various methods of evaluating the students' progress in automotive courses and several examples and suggestions as an aid to further teacher development in this area of teaching have been listed. The last section of this resource unit includes a comprehensive list of teaching aids and reference materials offered by various publishers and by manufacturing concerns.

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1245. RUDIGER, ELMER ROBERT. *Educational Needs and Interests of People Concerning the Selection, Operation, and Care of the Automobile.* **Ed.D., 1952, University of Missouri. 182 p. Library, University of Missouri, Columbia.***

Purpose: To ascertain the educational needs, interests, and preferences of people concerning the selection, operation, and care of the automobile, in order that school authorities may have evidence upon which to organize automotive instruction in high school and in adult education programs.

Source of Data: Data were secured through information blanks sent to 1147 automobile owners, 547 service managers, 18 automobile manufacturers, and 139 driver trainers, plus the available literature on automotive instruction. Responses to items on the information blanks were tabulated according to category and source.

Findings and Conclusions: The major emphasis in non-vocational automotive instruction should first be upon safe and economical operation, with proper care and maintenance, and intelligent selection ranking second and third in order. It is more important that people learn how to determine when their automobile needs adjustment and repairs than it is for them to know how to do the actual repairs themselves. Although the need for educating people in the proper selection, operation, and care of the automobile has existed for many years, the public schools unfortunately have done very little toward providing this training. Most people would like to learn more about automobile selection, operation, and care providing they could do so in a way that would be convenient and inexpensive. There is a need for courses dealing with automobile selection, operation, and care in public high schools and in adult education programs. There is a need for more comprehensive courses in public high schools relative to non-vocational automotive instruction.

1246. SKINNER, RAYMOND J. *A Proposed Photographic Technique for Improving Night Safe Driving Instructions in a High School.* **M.S. in Ind. Ed., 1949, Kansas State Teachers College. 50 p. Porter Library, Kansas State Teachers College, Pittsburg.**

Purpose: To analyze the conditions and photograph the subjects for a set of slides to be incorporated in the program of night safety driving.

Source of Data: Twelve conditions are presented as representative of the areas where night driving accidents might, or do occur. These were photographed and converted into slides. The technique of slide making is included.

Findings and Conclusions: Since driver education is usually taught in the high school during daylight hours, it was thought desirable to utilize and create suitable materials that may be used in teaching of safety in night driving. A technique is described which can be employed by an instructor irrespective of previous photographic experience.

1247. SMITH, WILBUR HOLMES (M.A.). *The Teaching of Automechanics.* **George Peabody College, 1933. 154 p.**

The collection and organization of instructional material for the teaching of automechanics in the industrial arts department of the public schools.

1248. SNYDER, JAMES MONROE (Masters). *Carburetion: with Emphasis on Content for Instruction.* **Ohio State University, 1940. 79 p.**

1249. SOULE, DAVID HOUGHTON. *Effects of Training on Driving Performance of Youthful Drivers in Iowa.* **M.S., 1950, Iowa State College. 52 p. Library, Iowa State College, Ames.**

Purpose: To ascertain whether or not the present system of driver education in Iowa has improved the performance of drivers between the age range of 14 to 25 years.

Source of Data: Two groups, were selected, one having had training, one not having had training. Drivers were judged on miles per accident, miles per conviction, and size of home town.

Findings and Conclusions: Untrained males drove more miles per year than trained males.

Trained males involved in accidents drove twice as many miles as trained males who were accident free. This was not true with the untrained group. Trained drivers lived in towns twice as large as untrained drivers. Untrained drivers had three times as many convictions as trained drivers.

1250. **STONE, LEONARD ALFRED.** *A Course of Study in Driver Education Based Upon an Analysis of Traffic Accidents in Arizona.* M.S., Iowa State College, 1941. 71 p.

A course of study in driver training.

1251. **STRONG, CHARLES R. (M.S.).** *Validation of Instructional Repair Jobs for Trade Classes in Automotive Maintenance.* The Stout Institute, 1940. 132 p.

A survey of the jobs being done in automotive maintenance garages by means of interviewing forty-seven service managers of garages in Detroit, Michigan, to determine the need for inclusion of certain units in automotive maintenance courses of study.

1252. **SUHR, VIRTUS WILLIAM.** *Relationship of Personality Traits and Certain Psycho-Sociological Factors to Driving Performance of Commercial Drivers.* M.S., 1953, Iowa State College. 77 p. Library, Iowa State College, Ames.

Purpose: To compare personality traits and certain psycho-sociological factors of a group of commercial drivers rated above average by their superiors to a comparable group rated as below average by the same persons.

Source of Data: Data were collected from three shipping companies located in three mid-west cities. Several measures were administered to each of the 60 drivers.

Findings and Conclusions: The above average drivers rated significantly different on several of the measured traits from those rated below average. Supervisors ratings worked just as well as accident records as a criterion.

1253. **TURNEY, WILBUR LELAND.** *A Proposed Driver Education Program For The Kern County, California, Union High School District.* M.S., 1953, Oregon State College. 107 p. Library, Oregon State College, Corvallis.

Purpose: To formulate a driver education and training program for the Union High School District.

Source of Data: Data were secured from the American Automobile Association, The National Conservation Bureau, and educational publications.

Findings and Conclusions: Classroom facilities and teacher preparation were adequate. Credit should be given toward graduation for driver education. All schools in the district included driver training in their driver education program. Adult driver education should be provided.

1254. **VAUGHN, G. DALE.** *Promoting a Program of Driver Education in the Public Schools of North Carolina.* M.A., 1948, Ohio State University. 68 p. Education Library, Ohio State University, Columbus.

Purpose: To show the need for a program of driver education in the schools of North Carolina and the means which might be used to carry out a program to increase safety, reduce accidents and develop better drivers.

Source of Data: Data were secured by personal letter to school administrators, Carolina Motor Club, North Carolina State Committee for Traffic Safety, National Safety Council, National Bureau of Conservation and the American Automobile Association.

Findings and Conclusions: The human factor is mainly responsible for many automobile accidents. Society and the schools must accept their responsibility for educating drivers, both experienced and inexperienced, to accept their personal and social responsibilities as drivers, to the end that accidents and fatalities may be reduced to a minimum.

1255. **VAUGHN, GERALD OLIVER (M.A.).** *Materials of the Automobile Trade: Their Source, Composition, Production and Use.* Stanford University, 1939. 168 p.

An attempt to provide information on the materials of the automotive trade which can be used by the shop instructor for his related information.

1256. **WHITE, ALVIN MERRITT.** *A Study of the Auto Mechanics Courses Taught in the Senior High Schools of Texas and the Opinions and Recommendations of School Administrators and Industrial Arts Teachers Concerning Auto Mechanics.* M.S., 1949, North Texas State College. 62 p. Library, North Texas State College, Denton.

Purpose: To ascertain the extent to which auto mechanics courses are being offered, their purposes, content, teaching methods, and to discover what administrators and teachers think should be included in such courses.

Source of Data: Questionnaires were sent to school administrators, mechanics and industrial arts teachers in Texas high schools concerning auto mechanics courses offered and their opinions as to the type of courses which should be offered.

Findings and Conclusions: Training in the operation and maintenance of the automobile is one of the most practical needs of high school youth. Each high school should offer driver training and auto mechanics should be a part of the industrial arts program. The state department of education should prepare a bulletin outlining a course in auto mechanics for the high schools of the state.

1257. WHITE, LELAND WALTER. ***Industrial Arts Auto Mechanics For South Dakota.*** **M.Ed., 1951, Colorado Agricultural and Mechanical College. 91 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.**

Purpose: To develop instructional units for industrial arts auto mechanics for South Dakota high schools.

Source of Data: Data were obtained from questionnaires sent to South Dakota industrial arts instructors teaching auto mechanics.

Findings and Conclusions: Units suggested by auto mechanics teachers and included in the course of study were: introduction, motor tune-up, automotive electricity, lubrication, car service, safety, power flow, body and chassis, and motor overhaul.

1258. WILSON, MANNIE RAY (M.S.). ***Determining an Efficient Extension Course on Ignition, Carburetion, and Service Testing.*** **Colorado Agricultural & Mechanical College, 1941. 153 p.**

A survey of garage owners, shop foremen, auto mechanics, and manufacturers in Chanute and Manhattan, Kansas, to develop content for a course in ignition, carburetion, and service testing for the Chanute Trade School. Job units, job analysis, and the course of study are set up.

General Shop

1259. ALLEN, ORLO F. ***What Would Constitute an Adequate General Shop for the Archetypal High School.*** **M.S., 1955, University of Wyoming. 84 p. Library, University of Wyoming, Laramie.**

Purpose: To introduce a limited comprehensive general shop.

Source of Data: Data were secured by a questionnaire sent to high schools in a seven state area and an examination of professional literature.

Findings and Conclusions: The comprehensive general shop is a means of widening the general education functions of the small high school. The general shop teacher must work out for himself the best course combinations for his situation and he should have high native ability, adaptability, and be trained in methods and subject matter related to the efficient imparting of information.

1260. BILLINGHAM, G. H. (Masters). ***The General Shop in Industrial Arts Education with Particular Reference to the Situation in New England and New Jersey.*** **New York University, 1931.**

1261. BROWN, ALBERT E. ***Ninth Grade Comprehensive General Shopwork.*** **M.A., University of Minnesota, 1948. 242 p.**

A course of study for ninth grade boys in comprehensive general shopwork based on characteristics and needs of adolescent youth.

1262. CAPRON, J. HUGH. ***Electrical Area of the General Shop (Resource Unit).*** **M. S., 1949, The Stout Institute. 71 p. Library, The Stout Institute, Menomonie, Wis.**

Purpose: To promote modernization of the electrical area in the secondary school industrial arts shop.

Source of Data: Courses of study, texts, and syllabuses were analyzed to determine whether the content which they suggested for the electrical area could accomplish the established objectives of industrial arts. These materials were found to be inadequate and accordingly, material was gathered from the synthesis of a resource unit.

Findings and Conclusions: The thesis established a set of ten objectives for the electrical area: Interest in the electrical industry, household electrical maintenance, consumer information about electrical equipment, self-discipline and initiative, cooperative attitude, health and electrical safety, interest in achievement, orderly performance, electrical drawings and design, and electrical knowledge and skills. The teaching materials necessary to accomplish these objectives in the form of a resource unit are also presented. Further studies in the industrial arts electrical field with emphasis on equipment and materials are suggested. The material developed in this thesis to be used to plan the electrical course in secondary school industrial arts programs is also recommended.

1263. CARR, OSCAR TAFT. ***Suggested Program Industrial Arts for the Senior High School.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1939. 58 p.**

A proposed general shop course, with projects and references for a small school.

1264. CESSNA, HAROLD M. (M.S.). ***Can Pattern Making Be Adapted as a Unit in General Shop?*** **Colorado Agricultural & Mechanical College, 1941. 143 p.**

A course set up to include five units: (1) blueprint reading, (2) modeling in clay, (3) patternmaker knowledge, (4) constructing wood patterns, (5) safety.

1265. CHRISMAN, PAUL GLENDENE. ***Course of Study for Industrial Arts in Royster Junior High School.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1940. 80 p.**

A proposed course of study for a general shop, including projects, references, and instruction sheets.

1266. CONLEY, WILLIAM E. ***The Design and Construction of a Lapidary Unit for a General Shop.*** **M. A., 1953, Chico State College. 60 p. Library, Chico State College, Chico, Calif.**

Purpose: To design, construct and test low cost equipment for lapidary work in a general shop.

Source of Data: Information was taken from books, magazine articles, manufacturers' advertisements and ideas of the writer conceived through experience. Each piece of equipment was treated with reference to its use, design and construction.

Findings and Conclusions: Low cost lapidary equipment that will operate satisfactorily can be constructed.

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1267. DECKER, HOWARD S. ***Related Information in the General Shop.*** **Ed. D., 1953, Columbia University. 98 p. Teachers College Library, Columbia University, New York.**

Purpose: To examine the area of related information in the industrial arts general shop.

Source of Data: Data were obtained from a review of the aims of industrial arts and a study of the materials, processes, and products which industrial arts and industry have in common.

Findings and Conclusions: Five basic ways of manipulating materials were evolved; plasticrafting, separation, fabrication, internalization and externalization. Related information should be introduced at the teachers college level in the shop, methods, and curriculum courses.

1268. DICK, ARTHUR A. (M. A.). ***A Dual Organization of General Shop with Related Subjects.*** **University of Maryland, 1940. 67 p.**

An analytical study designed to determine the average proportion of time that should be devoted to the teaching of related subject matter (nonmanipulative work) and skills at the junior high school level in the general shop.

1269. GALL, WALTER F. (M. S.). ***A Plan for a General Shop Course Based on the Interests, Hobbies, and Home Work of 9th Grade Boys.*** **Colorado Agricultural & Mechanical College, 1939. 234 p.**

Course content for a ninth grade general shop. Suggested individual material for the general shop program is included.

1270. GIBSON, HUBERT ROSCOE. ***A Proposed General Shop Program for a Small High School.*** **M. S., 1955, Oklahoma Agricultural and Mechanical College. 51 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To obtain information concerning general shop work areas best suited to a small high school.

Source of Data: Data were obtained from books, magazines, and pamphlets in the college library.

Findings and Conclusions: The general shop program, formerly being utilized more on the junior high school level, is very rapidly gaining popularity in the senior high schools.

1271. GUNN, ROBERT L. *A General Shop for the Training School of the State Teachers College, Eau Claire, Wisconsin.* M. A., University of Minnesota, 1948. 104 p.

An analysis of the purposes, objectives, offerings, content, method, administration, and management of a general shop in an industrial arts teacher-training institution.

1272. HALL, RONALD HERBERT. *A Basis for Reorganizing A General Woodworking Shop Into A Composite-General Shop For Washington High School, Bethel, Kansas.* M. S., 1953, Kansas State Teachers College. 63 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To plan the conversion of the present woodworking shop in Washington High School to a composite general shop so as to better meet the need of students in that community.

Source of Data: Data were obtained from a survey of Bethel, Kansas, an occupational study of graduates, and a study of the literature on the composite general shop.

Findings and Conclusions: Floor plan for the recommended composite geenral shop, areas of activity, and tool and equipment list for each area are given.

1273. HARRIS, THOMAS AUGUSTUS. *Organization and Administration of the Industrial Arts General Shop: A Study of Procedures Used with Beginning Groups.* M.A., 1949, University of Maryland. 78 p. Library, University of Maryland, College Park.

Purpose: To determine current practices prevalent in outsanding general shops relative to organizational and administrative procedures used with beginning groups in the industrial arts general shop.

Source of data: A questionnaire was submitted to 35 teachers who were recommended by industrial arts teacher-educators as outstanding in the teaching of the general shop. The data were collected and tabulated graphically so that each situation may be studied individually.

Findings and conclusions: No definite relationship existed between the individual teacher's teaching experience as measured in years and the organizational procedures used with beginning groups of pupils. No definite relationship was shown between the organizational procedures used and the grade level of beginning groups, the size of beginning groups, and the size of the general shops. Work activity was started in over half of the shops before the fifth class period and in approximately one-third began during the second class period. In many instances an orientation lecture, shop tour, introduction to pupil-personnel plan and the shop regulations constitute the content of the first class period. In most shops, project construction or project planning was the first work activity engaged in by the pupil. The project, used as the initial work activity in most cases, was selected by the teacher and the pupil. Teacher selection of the project was second in popularity in the shops studied. The advantages attributed to the use of instruction sheets were: Increased teacher time for individual instruction and more information covered in the allotted amount of time. The disadvantage was the apparent apathy of the pupils toward reading.

1274. HART, KARL E. *The Effective Use of the Farm Shop Facilities for Teaching General Shop Industrial Arts Courses in Southeastern Idaho.* M.Ed., 1951, Agricultural and Mechanical College of Texas. 41 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the practicability of offering an industrial arts program in a farm shop, and to suggest additional equipment needed.

Source of data: Data were obtained from books, periodicals, and newspaper articles.

Findings and conclusions: In most cases effective use of farm shop facilities requires their use in an industrial arts general shop program, and there is need for such an expanded program in our rural schools. The tools, equipment, and space requirements are so similar that both programs could be carried on satisfactorily by using the same facilities. One of the most satisfactory solutions may be to train a teacher in both industrial arts and farm shop.

1275. HELDRETH, WILLIAM VIRGIL (Masters). *Characteristics of the General Shop.* Iowa State College, 1940.

1276. HICKS, JAMES W. *A Curriculum Study in the General Shop for a Large City High School.* M.S., 1950, Oklahoma Agricultural and Mechanical College. 110 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To be helpful to future studies and aid general shop teachers in planning their curriculum.

Source of data: Library technique.

Findings and conclusions: Conclusions are: The first recorded adaptation of the general shop idea was made by Russel and Banser in 1910, industrial arts has an interesting past and even brighter future, industrial arts is an integral part of general education, the general shop advantages and disadvantages and possible solutions, and some factors to be considered in the planning of a general shop curriculum.

1277. **HIGGINS, F. LEROY.** *Proposed General Shop For The Northeast Johnson County Junior High Schools.* M.S., 1954, Kansas State Teachers College. 50 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a plan for setting up composite general shops in four new junior high schools in Shawnee Mission, Johnson County, Kansas.

Source of data: Data were obtained from a questionnaire and from literature on the composite general shop, shop planning, and organization.

Findings and conclusions: The report includes a floor plan, and tool and equipment list for the four identical shops, with areas in electricity, plastics, woodwork, metalwork, printing and drawing.

1278. **HUNTER, ZEBEDEE.** *A Proposed General Shop Program For the Attucks Separate School, Ponca City, Oklahoma.* M.S., 1955, Oklahoma Agricultural and Mechanical College. 41 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To propose a general shop program for a junior high school.

Source of data: Data were obtained from books, magazines, and pamphlets; from interviews with junior high school shop teachers.

Findings and conclusions: The general shop has proven itself to be the best type of shop program for the junior high school level. Courses offered in the general shop should be representative of community needs.

1279. **IRISH, JOSIE CLINTON.** *Development Study of Comprehensive General Shop.* M.Ed., 1949, Colorado Agricultural and Mechanical College. 76 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To present an historical development of the comprehensive general shop, 1918 to 1949.

Source of Data: Review of literature. A check sheet submitted to 60 industrial arts teachers.

Findings and Conclusions: A rapid growth of the general shop idea has occurred since its inception. It is particularly adaptable to junior high schools and to small senior high schools.

1280. **JACKSON, JOHN G.** *A Study of the Development of the General Shop Program in the Junior High Schools of Hillsborough County, Florida.* M.Ed., 1952, University of Florida. 69 p. Library, University of Florida, Gainesville.

Purpose: To trace the history and development of industrial arts in the junior high schools of Hillsborough County, and to evaluate the present program.

Source of Data: Data were secured from the Director of Industrial Education, Hillsborough County, personal interviews, the minutes of the meetings of the County Board of Public Instruction, and from selected texts and references.

Findings and Conclusions: The general shop program in most of the junior high schools provides experiences in woodwork, metalwork, electricity, leathercraft, and drafting. Among the values emphasized are consumer knowledge, safety practices, vocations, avocations, cooperative endeavor, maintenance operations, and creative design.

1281. **JOHNSON, ROBERT J.** *Areas of Instruction for the One Man Comprehensive General Shop for the State of Maryland.* M.S., 1950. The Stout Institute. 68 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To secure information for the expansion and the evaluation of the present industrial arts program for the senior high school level.

Source of Data: The methods of research used are: A survey of the literature in the field, and check-list to survey the teachers of Maryland.

Findings and Conclusions: The information collected has been assembled in a summary of the junior high school general shop program and in an analysis of the senior high school plan. The summary of the junior high school program includes: Philosophy, the objectives, and the areas of instruction. The analysis of the senior high school plan presents: The philosophy, the objectives, the criteria for the selection of areas of instruction, and the areas of instruction for the general shop at the senior high school level. It is recommended that: The range of areas in the senior high school be as broad as possible, the area of drafting be taught as a unit at the beginning of the school year, the basic areas of each general group be included with the plan, the criteria be considered in area selection, and the selection of areas be made by committees rather than by individuals.

1282. KASPER, RANDOLPH. *Reorganizing a Unit Woodworking Shop into a Composite General Shop in the LaCygne Rural High School, LaCygne, Kansas.* M.S., 1953, Kansas State Teachers College. 64 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To explain how the unit woodworking shop at LaCygne Rural High School, LaCygne, Kansas, can be converted into a composite general shop.

Source of Data: Data were obtained from books, articles, unpublished materials, school records, and by interviews. A study of present facilities, community occupational changes and budgetary considerations was made.

Findings and conclusion: The study resulted in a converted shop floor plan, a list of tools necessary for a composite shop, recommended activities for the composite general shop, plan for sequential introduction of activities as annual budget permits, and suggestions for enlarging the shop building.

1283. KLINGINSMITH, JERROLD E. *A Basis for the Establishment of the Graphic Arts Area in the General Shop.* M.S., 1952, Kansas State Teachers College. 133 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To validate the thesis that the graphic arts area has a definite place in the general shop program.

Source of Data: Data were obtained from books, bulletins, pamphlets, and magazine articles.

Findings and Conclusions: Basic philosophies of the general shop are in accordance with the activities carried on in graphic arts. The graphic arts affords many opportunities for the fulfillment of various objectives of an industrial arts program. A general shop program is planned and included in the study.

1284. MARTENS, ARTHUR C. (Masters). *Course Content for the General Shop in Consolidated Schools.* Iowa State College, 1939.

1285. MILLER, MAURICE FRED. *Reviews of Selected Readings About the General Shop.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 89 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To review articles that show the past and present objectives, methods of teaching, and types of shop organization that have led to the development of today's general shop.

Source of Data: Data were obtained from the Manual Training Magazine, The Industrial Arts Magazine, The Industrial Education Magazine, Industrial Arts and Vocational Education and School Shop.

Findings and Conclusions: There is a limited amount of information concerning the history and early development of the general shop.

1286. NELSON, MAURICE J. *The General Shop.* M. A., University of Minnesota, 1936. 120 p.

A canvass of the special literature on the general shop, as an offering or procedure in industrial arts instruction.

1287. PARSONS, CHARLES P. (M. S.). *A Study of the General Shop.* University of Tennessee, 1937. 115 p.

A study of the general shop and its functional possibilities giving the types of shops and the organization of each type that will fill the needs of any community that may desire to use them. The data is based on the compilation of facts from 1915 to 1937.

1288. PITSINGER, ARTHUR R. (Masters). *Planning a General Shop for the Small High School.* Miami (Ohio) University, 1940.

1289. RICHARDS, EDWARD E. (Masters). *A General Shop Course of Study for the Junior High School.* University of Wisconsin, 1933.

1290. **SHONK, RAY E.** *Reorganizing a Unit Woodworking Shop into a General Shop for the Webb City, Mo., Junior-Senior High School.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 73 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To reorganize a well-equipped woodworking shop into a composite general shop at Webb City, Mo. To provide a suggested course of study to operate in this shop.

Source of Data: Survey of the industrial arts situation at Webb City.

Findings and Conclusions: Report gives comparison of the 2 plans. Reorganization proposal includes plan such as written instruction aids for drawing, metal work, electricity, and woodwork.

1291. **SHUMMY, KENNETH F.** (Masters). *A General Shop Type of Industrial Arts Program for the Small High Schools of Arizona.* Arizona State Teachers College, 1944.

1292. **STANDISH, HORACE EDWARD** (M. A.). *General Shop Based on Rural Home Repairs in Davidson County.* George Peabody College, 1933. 61 p.

An analysis of the mechanical jobs being done in the rural homes of Davidson County, Tennessee in an effort to determine the content for a general shop program in this area.

1293. **STARK, JOHN G.** *Reorganization Of The Unit Shop Into A General Shop For The Fort Scott High School.* M. S., 1953, Kansas State Teachers College. 51 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To convert the unit woodshop into a comprehensive general shop in the Fort Scott, Kansas, junior high school.

Source of Data: Data were obtained from a survey of local industries, a study of student needs and interests, and an examination of literature.

Findings and Conclusions: The report includes a plan for enlarging the shop facilities. Areas for the proposed shop are: woodworking and finishing, general metal (bench, sheet, and forging), electricity, mechanical drawing, and plastics.

1294. **STERNER, LEWIS H.** (Masters). *The Carpentry Unit in the General Shop Program.* University of Michigan, 1938.

1295. **STORM, ARTHUR** (M. S.). *The Comprehensive General Shop as a Means of Providing Industrial Arts in a Small High School.* University of Southern California, 1940. 105 p.

A study dealing with the value of the general shop as opposed to the specialized shop in teaching industrial arts, particularly in smaller schools. The aims and objectives of the general shop laboratory are discussed, and units of work to be included in the general shop course are selected and evaluated.

1296. **SWANSON, ROBERT S.** *Opportunities for Implementation of the Philosophy and Objectives for Industrial Arts in the One-Man Comprehensive General Shop.* M. S., 1950, The Stout Institute. 61 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To investigate means of organizing and operating a one-man comprehensive general shop in accordance with the philosophy and objectives established by the 1949 Wisconsin Industrial Arts Curriculum Committee.

Source of Data: The writer reviewed books and bulletins published since 1920 and periodicals published since 1930 containing information about philosophy and objectives for education and for industrial arts, types of industrial arts shops, course content for the one-man comprehensive general shop, organization for instruction in the one-man comprehensive general shop, and evaluation of the education product.

Findings and Conclusions: Unit shops and general unit shops may be used for the teaching of some degree of specialization, but the general shop is particularly adapted to general education purposes in the small school and the junior high school. Course content for the comprehensive shop should be selected from a wide range of activities and may be organized for instruction purposes by the method of trade and job or activity analysis. This study contains a check list for evaluating teaching methods in terms of principles of learning. Evaluation of the educational product involves a formulation of objectives, analysis of the objectives in terms of expected behavior changes, the identification of testing situations, and the development of adequate measuring devices, and the interpretation and use of the results. Further study be made of the use of the comprehensive shop plan in other situations. Development of practical devices for selecting and evaluating teaching methods is needed. The student personnel organization is not being fully exploited. Simple, efficient evaluative devices are lacking in industrial arts.

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1297. **THOMPSON, ROBERT LONG** (Ed. D.) *Related Information for the Comprehensive General Shop in a Functional Junior High School Industrial Arts Program in New York State.* New York University, School of Education, 1947. 872 p.

An analysis of the supplementary courses offered in industrial arts programs. A brief history and explanation of the objectives, principles, and practices are given to acquaint the reader with the need for such related material.

1298. **TIGUE, JOHNNY E.** *A Course of Study For A General Shop in Industrial Arts in Grades Seven and Eight.* M. S., 1952, University of Tennessee. 104 p. Library, University of Tennessee, Knoxville.

Purpose: To develop a course of study for an industrial arts general shop for grades seven and eight.

Source of Data: Data were secured from other course outlines and current publications.

Findings and Conclusions: A course is proposed for the seventh grade including woodworking, general electricity, plastics, and home mechanics, and for the eighth grade, including advanced woodworking, general metals, and mechanical drawing. Lists of equipment necessary for each of these areas of activities are presented, together with a shop layout necessary to house this equipment and these areas.

1299. **VAN LIEW, WAYNE.** *Wrought Iron as a Unit in the General Metal Shop of a Junior High School.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 80 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To explore the possibilities and to justify, if possible, the inclusion of wrought iron as a unit in the general metal shop of a junior high school.

Source of Data: Material for the study was gathered partially from textbooks, magazines and pamphlets obtained from the library of College High School, Bartlesville, Oklahoma. Other material was obtained from manufacturers in Tulsa and Oklahoma City, Oklahoma.

Findings and Conclusions: If the general metal shop is included in the high school industrial arts department, it should include a variety of experiences. At the present time too few, rather than too many, materials are used. A unit of elementary wrought iron is recommended for junior high school. The ease with which wrought iron may be fabricated places it within the working ability of small boys.

1300. **VIILO, WESLEY MICHAEL.** *Industrial Arts General Metal Work For Secondary Schools.* M. S., 1952, Iowa State College. 61 p. Library, Iowa State College, Ames.

Purpose: To identify the instructional units which should be taught in industrial arts general metal working at the secondary school level.

Source of Data: Data were compiled from twenty books written on the subject since 1937.

Findings and Conclusions: Areas commonly covered have been bench metal, sheet metal, art metal, forging, machine shop, welding, and foundry. These seven areas contain 508 instructional units and 23 major operations. Recently, there has been an increase in emphasis in all of the areas of metal working.

1301. **WAGNER, SAMUEL EARL.** *Establishing Welding as a Unit in the General Shop of a Senior High School.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 69 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To establish welding as a unit in the general shop of a senior high school.

Source of Data: Data were obtained from books and pamphlets from manufacturing companies.

Findings and Conclusions: Welding is almost indispensable in industry, and should be taught in all school shops. Too few rather than too many phases of industry are offered in the industrial arts program.

1302. **WARFORD, JOHN A.** *A Functional General Shop Industrial Arts Program for Bemidji State Teachers College Laboratory School.* M. A., 1949, University of Minnesota. 172 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To plan a functional program for the laboratory schools in light of the basic philosophy of education and of that institution.

Source of Data: Analysis of course content with particular attention given to activities, skills, and knowledges.

Findings and Conclusions: General shopwork must proceed from objectives which support the philosophy of industrial arts as general education.

1303. WISE, OSCAR (M. S.). *A Proposed Industrial Arts Course for the Junior High Schools of Amarillo, Texas.* Oklahoma A & M College, 1934. 139 p.

A proposed general shop course of study complete with instruction units, plans, equipment lists, method of teaching, and tests for the Junior High School of Amarillo, Texas.

Girls and Women

1304. ACUFF, CECIL W. *Industrial Arts for Girls.* M.S., 1950, Oklahoma Agricultural and Mechanical College, 58 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To exemplify and substantiate the value of industrial arts experiences for girls in the secondary schools and to show the need for the expansion and enrichment of such a course.

Source of Data: Data were secured from various publications.

Findings and Conclusions: Women and girls have need of training, instruction and experience in the realm of industrial arts. A course of study for a period of two semesters is proposed, including the following areas: Woodworking, electrical, mechanical drawing, automobile mechanics, household mechanics, crafts and hobbies, and safety instruction.

1305. BROWN, RAY E. (M.S.). *Home Mechanics Instruction for Girls.* Oklahoma A & M College, 1937. 72 p.

A survey of two hundred city schools on home mechanics courses offered for girls. Material is included to aid the administrator and industrial arts teacher in organizing courses.

1306. BUCK ROBERT, DALE (M.A.). *The Development of a Curriculum Unit in Ninth Grade Industrial Arts for Girls.* University of Denver, 1935. 63 p.

The development of a course of study in industrial arts for girls based on questionnaires sent to the girls, their parents, and a rating by a jury for checking content.

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1307. COOKE, ROBERT LOCKE (Ed. D.). *Trade and Industrial Education for Girls and Women in California.* University of California, Berkeley, 1932. 216 p.

A study of the problem of adequate education for the training of girls to meet their vocational needs. It also raises some problems for future consideration. The history of vocational education in California for girls is reviewed.

1308. DAVIES, ARTHUR D. *A Survey of Industrial Arts for Girls in Grade 7 Through 12 in the Public Schools of Butte County, California.* M. A. 1954, Chico State College. 72 p. Library, Chico State College, Chico, Calif.

Purpose: To learn the extent to which girls in grades 7 through 12 in selected schools of the county were receiving instruction in industrial arts, why they were or were not receiving such instruction, some of the problems and benefits resulting, and the opinions of principals, industrial arts instructors, and girls concerning industrial arts for girls.

Source of Data: Data were secured through three seperate interview forms and by personal observation of the schools included in the study.

Findings and Conclusions: Relatively few girls were enrolled in industrial arts. Principals, industrial arts instructors, and girl students in grades 7 through 12 are strongly in favor of girls receiving industrial arts instruction. The main factors which hinder the girls from receiving industrial arts instruction are: lack of facilities which include tools, shops, and instructors; lack of time due to the required course patterns, and school traditions.

1309. **GOSSETT, LULA (M.S.).** ***Trade Training Needs for Girls and Women in Garment Making and Cosmetology in San Antonio, Texas.*** **Colorado Agricultural & Mechanical College, 1934. 108 p.**

A study to determine the need for trade training for girls and women in the garment making and cosmetology trades in San Antonio. A training program is suggested based on occupational needs.

1310. **HOSTETTER, R. G. (Masters).** ***A Study to Determine School Activities Which Will Enrich the Mechanical Experiments of Girls in Mt. Joy, Pennsylvania.*** **University of Pennsylvania, c. 1935–47.**

1311. **JONES, W. MORRIS (M.S.).** ***A Study to Determine Content for a Course in Home Mechanics for Girls Based on Current Home Practice in an Industrial City.*** **Colorado Agricultural & Mechanical College, 1935. 56 p.**

A course in home mechanics for girls in East St. Louis, Illinois, to meet their needs for jobs performed in the home. Sixty-one jobs are included in the course.

1312. **KROLL, HARRY W. (M.S.).** ***Content for an Industrial Arts Course for Girls.*** **Iowa State College, 1938. 78 p.**

A survey of data to be used as content for an industrial arts course for girls. A list of 156 units is suggested.

1313. **LEMING, LAWRENCE SAMUEL.** ***Practical Mechanics For Girls.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1940. 110 p.**

A variety of job plans and related material on home design and household mechanics for girls.

1314. **LUSE, EUGENE ELMER.** ***Suggested Program In Home Mechanics for the Senior High School Girls, Maple Hill, Kansas.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1940. 46 p.**

Presents written instructional materials in home mechanics dealing with woodwork, electricity, finishing, automobile knowledge, and household safety.

1315. **LYNCH, DONALD.** ***A study of Indiana to Find What is Being Done for Girls in the Field of Industrial Arts or Similar Type Work.*** **M.A. 1952, University of Minnesota. 53 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To ascertain the number of Indiana schools which offer courses of an industrial arts nature to girls, and to obtain ideas as to what should be included in a program of this nature.

Source of Data: Data were obtained from questionnaires mailed to all schools in Indiana.

Findings and Conclusions: Girls are receiving some industrial arts training but only a beginning has been made in this field. Mixed classes were found to be prevalent. Girls will become interested in industrial arts if the content of the course of study is designed to meet their specific needs and interests.

1316. **MC COY, MILO ALFRED.** ***Industrial Arts for Girls: A Survey of the Interest and A Proposed Course of Study for Girls.*** **M.A., 1954, University of Minnesota. 87 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To determine the desirability of a course in industrial arts for the high school girls of Jackson Public Schools, what the course should include and how to prepare it to meet the needs of the community.

Source of Data: Data were obtained from the writings of industrial educators, from courses of study offered in other schools, and from a questionnaire sent to tenth and eleventh grade high school girls, mothers, and homemakers in the Jackson community.

Findings and Conclusions: There definitely is a need and a desire for an industrial arts course for high school girls in Jackson public schools.

1317. **McFARLAND, JAMES R.** ***Home Mechanics for Junior High School Girls.*** **M.S. in Ind. Ed., Kansas State Teachers College, 1940.**

A course of study in the form of written instruction sheets in home mechanics for girls.

1318. **PREBBLE, FRED (Masters).** ***Organized Material for Curricula in Home Mechanics for Girls and Home Mechanics for Boys.*** **Iowa State College, 1933.**

1319. **REID, ELDON GENE.** *A Study of Mechanical Household Activities Performed by Homemakers in the Home.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 46 p.

A study of the needs of housewives for training in home mechanics.

1320. **ROGERS, DWANE CARSON** (M. S.). *A Study of the Types of Home Mechanics That Would Be of Benefit to High School Girls.* A & M College of Texas, 1938. 36 p.

A course of study in home mechanics for girls, based on a brief analysis of need.

1321. **SHOEMAKER, CHARLES EDWARD.** *Girls in Industrial Arts, A Study of Their Status in the Secondary Schools of the State of New York.* M. A., 1951, The Ohio State University. 117 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the extent to which girls were enrolling in industrial arts in the secondary schools of the State of New York as a basis for consideration of future programs in the state.

Source of Data: Data were gathered by a questionnaire sent to schools offering industrial arts.

Findings and Conclusions: Instructors felt that they could teach girls in industrial arts with present facilities and that home mechanics and the general shop courses should be emphasized. Only 391 girls out of 20,000 were enrolled in industrial arts.

1322. **SHUMAKER, F. O.** (Masters). *Is There a Place for Girls in the Industrial Arts Phase of Practical Arts Education?* Miami (Ohio) University, 1932. 90 p.

1323. **SPERRY, CARL HARRISON.** *A Proposed Home Mechanics Course for High School Girls.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 111 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To develop a home mechanics course for senior high school girls which would help meet the activities, problems, and interests of future homemakers.

Source of Data: Data were obtained from a review of literature, from questionnaires sent to high school girl graduates, and from a study of offerings related to home mechanics activities in existing home economics courses.

Findings and Conclusions: Young housewives felt that training in home mechanics should be a part of the high school training for girls. They were interested chiefly in activities related to safety, electricity, upholstery and finishing. Rural dwellers were engaged in, and interested in, more home mechanics activities than urban dwellers. Home mechanics activities for girls were proposed for inclusion in a home mechanics course.

1324. **STIBER, IRVING L.** *Industrial Arts for Girls.* M. S., 1951, Stout State College. 91 p. Library, Stout State College, Menomonie, Wis.

Purpose: To arrive at a basis for selecting resource instructional material for a girls' industrial arts course in high school.

Source of Data: Data were obtained from both a questionnaire and a check list. A review of the available literature was made to set up a comprehensive list of instructional units in a girls' industrial arts program.

Findings and Conclusions: Instructional content suitable for use in industrial arts courses is found in books, magazines, pamphlets and advertisements. A survey of parental opinions is another source.

1325. **VOTH, MOSES H.** (M. S.). *The Organization of a Course of Study in Home Mechanics for Girls at Bethel College, North Newton, Kansas.* Colorado Agricultural & Mechanical College, 1941. 167 p.

Includes objectives to be met and numerous instruction sheets for the sixty-one jobs chosen for the course content.

1326. **WAHL, CARL W.** *Home Mechanics Program for Girls in Seaman Rural High School in Topeka, Kansas.* M. S., 1951, Kansas State Teachers College. 63 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the nature and scope of the mechanical activities performed by homemakers and prospective homemakers and to organize a course of study based on the data.

Source of Data: Data were obtained from a questionnaire submitted to 134 girls at the high school and the mothers of the girls and a review of literature.

Findings and Conclusions: A course of study was prepared, based on data collected and put in operation. After one year of operation the following conclusions were drawn: The girls' interest, response to instruction, quality of workmanship, and their eagerness to put their knowledge to work showed that the course has proved to be of sufficient value to deserve a permanent place in the school curriculum.

1327. WELLS, WALLACE WILDER (M. S.) *The Value of Industrial Arts for Secondary School Girls.* Oregon State College. 1946. 49 p.

This study compares the responses of industrial arts supervisors with those of housewives regarding the need for and nature of work in this area for girls.

1328. WERNER, ELDEN A. *A Suggested Program of Home Mechanics for Senior High School Girls, Waco, Texas.* M. S. in Ind. Ed., Kansas State Teachers College, 1940. 81 p.

A proposed course of study including "know" and "do" units in home mechanics for girls.

Graphic Arts

1329. AUGUSTINE, EDWARD WINNEMORE (M. A.). *An Industrial Arts Course of Study in Printing for the Senior High School.* University of Maryland, 1938. 127 p.

A curriculum for shop printing at the high school level, with methods of conducting the class and teaching aids suggested. Related subject matter is outlined, but emphasis is on the attainment of skills.

1330. BAKER, ROBERT WILLIAM, Jr. *Vocational Printing For The Joplin Public School System.* M. S., 1953, Kansas State Teachers College. 39 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To present a solution to the problem of establishing a vocational printing shop in the Joplin Public School System.

Source of Data: Data were obtained from interviews, a questionnaire, a survey, and library research.

Findings and Conclusions: A need exists for training printers in the Joplin area. An advisory committee would be essential to promote and develop the proposed program in the schools. Print shop floor plan and equipment list are included.

1331. BARNARD, DAVID P. (M. S.). *A Guide for the Preparation of Resource Units in Graphic Arts.* The Stout Institute, 1947. 143 p.

A survey of 134 printing instructors throughout the United States to prepare a guide for the preparation of resource units in graphic arts for use in constructing courses of study or selecting teaching units on the beginning level in secondary schools.

1332. BECKER, DANIEL W. *Inexpensive Equipment for Photographic Silk Screen Processes in Graphic Arts.* M. Ed., 1952, The Ohio State University. 25 p. Library, The Ohio State University, Columbus.

Purpose: To develop inexpensive equipment for photographic silk screen processes in graphic arts.

Source of Data: Data were obtained from business firms making photographic stencils.

Findings and Conclusions: The inauguration of a broader graphic arts program is possible through the construction of inexpensive equipment. The pieces developed were: a photo lamp, a contact printing table, an infra-red drying unit, and a light table.

1333. BELT, CHARLES A. *A Proposed Program of Study for Printing I Students of the Independence Community College, Independence, Kansas.* M. S., 1954, Kansas State Teachers College. 49 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a system for providing an adequate informational background for beginning students in production printing.

Source of Data: Data were obtained from textbooks, bulletins, articles, unpublished materials and written instruction sheets.

Findings and Conclusions: The short informational assignment sheet was found to be best adapted for the purpose. An informational classification is given, and twenty-two short informational assignment sheets are included as examples.

1334. **BILSEY, GEORGE J. (Masters).** ***Content Affecting the Development of Graphic Arts Laboratory.*** **Ohio State University, 1944.**

1335. **BINGLE, VERLIN EDWARD (M. S.).** ***High School Printing as a General Education Subject.*** **Oklahoma A & M College, 1932. 102 p.**

A study of the printing trades in Tulsa, Oklahoma, and printing as taught in the public schools of that city in 1932.

1336. **BLAKE, ALBERT W.** ***Course in Printing for the University of Arkansas.*** **M. Ed., 1951. Colorado Agricultural and Mechanical College. 45 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.**

Purpose: To develop an industrial arts course in printing for journalism students at the University of Arkansas.

Source of Data: Data were obtained from questionnaires sent to 56 publishers and newspapers, and 98 University of Arkansas journalism graduates. Analysis and evaluation of data determined the proposed instructional units.

Findings and Conclusions: Printing for journalism students should include instruction in: type, printer's mathematics, composition, proof reading, printing equipment, make-up, paper, history, safety, and ink.

1337. **BOYER, RAY A.** ***Linotype Instruction.*** **M. S., 1951, Kansas State Teachers College. 184 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To develop a course of study for linotype operation for the printing department of Kansas State Teachers College, Pittsburg.

Source of Data: Data were drawn from the experience of the writer in the trade and as a teacher.

Findings and Conclusions: A comprehensive course of instruction in linotype operation was developed and designed to cover two 18-week semesters of five hours laboratory and one hour lecture per week.

1338. **BRINK, LAWRENCE JOHN.** ***Development of a Proposed Course of Study for Introductory Industrial Arts Printing in Secondary Schools.*** **M. A., University of Michigan, 1948. 147 p.**

A critical examination of secondary school printing courses, their content, the textbooks used, teaching methods employed, with suggestions for the improvement of each.

1339. **BROWN, GEORGE C.** ***Printing Production Problems in Kansas High Schools.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1948. 73 p.**

A description of printing in the schools of Kansas with suggestion for its improvement.

1340. **BRUNER, CARL G. (Masters).** ***Study of the Possible and Achieved Values in Printing Instruction in the Public Schools.*** **Municipal University of Wichita, 1931.**

1341. **BUFFO, ANTON FRANK.** ***The Development of Printing Education and Its Probems With the Printing Industry.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1947. 199 p.**

A report dealing with trends in the printing industry, problems between schools and the printing industry, and problems in the printing education field. Offers a condensed unit in printing estimation for high school shops.

1342. **CLAUSEN, ELMER E.** ***Resource Units for General Printing.*** **M. S., 1949, Stout Institute. 100 p. Library, The Stout Institute, Menomonie, Wis.**

Purpose: The purpose of this study was to develop a resource unit on platen presswork for general printing.

Source of Data: The philosophy of resource units in the industrial arts curriculum was traced. A set of eleven objectives for general printing was determined and justified in rank of importance by a questionnaire to printing teachers and printing educators.

Findings and Conclusions: The content of general printing in courses for the secondary schools of Wisconsin was determined. Sixty-three printing teachers ranked general printing education objectives in the following order: Good work habits, respect for materials and equipment, responsibility, vocational exploration, cooperation, self-pride, manipulative processes, consumer information, application for academic knowledge, respect for labor and industry, and design and color. The division on platen presswork was developed as a resource unit to be a sample in the development of other resource units through the Wisconsin Industrial Arts Curriculum Committee.

1343. CONNET, NELSON MARVIN. *A Graphic Arts Course of Study for a Large High School.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 97 p.

A course of study in graphic arts for a large high school, including typography, design, paper, engraving, presswork, and bookbinding.

1344. CRANKSHAW, HAROLD G. (Masters), *Studies in Vocational Printing Education.* Cornell University, 1932. 37 p.

1345. CUTLER, LAURENCE G. *An Approach to the Problem of Design for the Teacher of Printing.* M. S. in Ind. Ed., Kansas State Teachers College, 1948. 68 p.

A discussion of design in printing with a proposed plan for teaching design in an industrial arts print shop.

1346. DARDEN, LAWRENCE C. *Competent Employees for the Mechanical Department of the Negro Press.* M. S. in Ind. Ed., 1949, Kansas State Teachers College. 62 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To investigate the shortage of skilled Negro printers; the lack of a good cooperative program between industry and the schools.

Source of Data: Comprehensive review of the literature on the Negro press, personal interviews with employers and employees, and questionnaires were used in obtaining data.

Findings and Conclusions: Schools should provide a good guidance program. Certain schools' trade curricula were controlled by trade unions. Employers recognize the need for greater cooperation between industry and the school; believe that more young men should be encouraged to enter the printing field; more publicity should be given to the schools of printing now in operation.

1347. DE SPAIN, JOSEPH E. *Reorganization of the Printing Division of the Labette County Community High School.* M. S., 1951, Kansas State Teachers College. 43 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To reorganize the Printing Division of the Labette County Community High School in terms of a growing school population and to more nearly fit the needs of students who do not go on to college.

Source of Data: Data were obtained from interviews with potential employers of new printers.

Findings and Conclusion: The industrial arts printing program should be broadened to include new areas. New modern printing equipment needs to be purchased. The vocational printing program should be broadened to include new areas of vocational preparation.

1348. DEVORE, JAMES. *Selected Problems in Teaching Industrial Printing.* M. A., Claremont College, 1948. 76 p.

A study of the day-to-day problems encountered by the school printing instructor.

1349. FEE, FRANK T. (M. S.). *A Unit of Instruction on the Platen Press for Beginning Workers.* Colorado Agricultural & Mechanical College, 1943. 172 p.

An investigation of the background of the trade and the methods of teaching. The job of pressman is analyzed and a training program is outlined.

1350. GAY, WILLIAM HENRY. *Graphic Arts Course of Study for Wichita Intermediate Schools.* M. S., 1952, Kansas State Teachers College. 72 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To determine what should be included in a graphic arts course for the Wichita, Kansas, intermediate schools.

Source of Data: Data were obtained from literature and a survey.

Findings and Conclusions: First course should be general graphic arts, including as many areas as possible. Course developed and recommended is built around eight areas of graphic arts.

1351. GUNDERSEN, MORTEN A. *A Proposed Course of Study for Teaching Paper Technology in Relation to Printing in the Vocational Shop.* M. S., 1951, Kansas State Teachers College. 102 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a workable and ready-to-use course of study in paper technology.

Source of Data: Data were obtained from reference material, a questionnaire sent to selected printers, and literature from paper manufacturing companies.

Findings and Conclusions: A comprehensive course of study in paper technology was developed consisting of nine units of instruction as follows: printing qualities of paper, ordering and selecting paper, classification of paper, fitting the paper to the job, estimating paper, cutting paper stock, handling and storing paper, envelopes, and proper press for various papers.

1352. HAMILTON, RODERICK S. (M. A.). *An Industrial Arts Course in Printing for Senior High Schools.* Stanford University, 1933.

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1353. HANSBURG, HENRY (Doctors). *The Use of the Print Shop in the Improvement of Spelling, Reading and Visual Perception.* Teachers College, Columbia University, 1935.

1354. HENRIKSON, GEORGE C. *Teaching Linotype Operation.* M. A., 1944, University of Minnesota. 103 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To examine the details of the organization and presentation of units of instruction in linotype operation.

Source of Data: Data were obtained from experiences, experiments, and related literature.

Findings and Conclusions: Definite assignment of fingers in the lower case section, especially in the initial stages of learning the operation of the keyboard, seem to aid in the learning process.

1355. HILL, JAMES (M. A.). *Design in Bookbinding for Public Schools in Colorado.* Colorado State College of Education, 1938. 70 p.

A study showing the possibilities of cover designing in bookbinding. The author presents inexpensive and creative methods for designing and creating type designs for bookbinding.

1356. HURT, GILBERT TURNER (M. S.). *The Operation and Maintenance of the Linotype Machine.* University of Tennessee, 1948. 113 p.

An analysis of some of the basic operations and related technical information needed by linotype operators together with suggestions for a training program on the vocational allday trade school level. A study of the development of printing to the modern linotype machine is included.

1357. JOHNSON, JOSEPH B. *Appropriate Projects in Graphic Arts as an Industrial Arts Handicraft.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 24 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To ascertain whether certain graphic arts activities are applicable to handcrafts and to find out what type of projects may be used in graphic arts handcrafts.

Source of Data: Literature on handcrafts was reviewed, the graphic arts were analyzed to ascertain thes areas suitable for use in the handcrafts, and selected projects were tested by teaching the prepared units to a class.

Findings and Conclusions: The following graphic arts activities were applicable to handcrafts: Photography, bookbinding, silk screen processes, poster work and linoleum block printing. Projects were selected and tested to ascertain their appropriateness for graphic arts units considered applicable to handcrafts.

1358. KIRK, HAROLD HOLMES (M. A.). *Book Binding.* Ohio State University, 1940. 218 p.

An overview of bookbinding in an effort to point the way to its introduction into the offering in industrial arts and especially into the area of instruction in the graphic arts in secondary schools.

1359. KNAPE, HAROLD (M. A.). *A Suggested Course of Study for Letterpress Printing in the Senior High School.* Southwest Texas State Teachers College, 1947. 70 p.

Presents a study outline for letterpress printing as a phase of graphic arts in the senior high school.

1360. LAMB, CLARENCE A. (Masters). *A Course of Study in Printing and Related Subjects for Continuation School Classes.* University of California, 1932.

1361. LARSON, ROY O. (Masters). *The Validation of a Course in General Printing.* The Stout Institute, 1940.

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1362. MALISZEWSKI, RICHARD PAUL. *Improving Printing Education.* M. A., 1952, University of Minnesota. 75 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To find out how printing education can be brought into proper alignment with the printing trades insofar as the coverage of the basic processes is concerned.

Source of Data: Data were obtained by means of a study of existing conditions in school shops, job shops and industry, personal visits, questionnaires, and publications.

Findings and Conclusions: Along with keeping up with the fast pace of technological progress in the field of letterpress printing, teachers can best improve printing education by introducing means and methods of teaching offset-lithography.

1363. MARINACCIO, ANTHONY (M. A.). *Intagliography—A Study of Its History, Technique, and Equipment.* Ohio State University, 1939. 280 p.

A review of the literature of graphic arts for references on intaglio printing. It presents information for the industrial arts teacher regarding the initiation and conduction of a course in intagliography.

1364. MARLOW, HARPER LEROY. *Silk Screen Printing and Improvised Facilities.* M. A., 1951, University of Maryland. 181 p. Library, University of Maryland, College Park.

Purpose: To determine the appropriateness of commonly available materials for silk screen printing.

Source of Data: Data were secured through a review of the literature and from experimentation.

Findings and Conclusions: Improvised silk screen printing provides a means of expanding the industrial arts offerings in a school curriculum at a negligible cost. Suggestions are made relative to materials and techniques of improvised silk screen printing.

1365. MOERDYK, GLEN D. *Six Semester Courses in Graphic Arts.* M. A., 1954, Western Michigan College of Education. 69 p. Library, Western Michigan College of Education, Kalamazoo.

Purpose: To formulate six semester courses in the graphic arts on the high school level.

Source of Data: Data were obtained from a recent periodical literature, the suggested areas for graphic arts in A Guide To Improving Instruction In Industrial Arts, and analysis of textbooks in the field.

Findings and Conclusions: Six semester courses were formulated including Fundamentals of Letterpress Printing; Design in Printing; Advanced Composition, Presswork and Bindery Problems; Planography and Bookbinding; Mitography, Papermaking, Intaglio and Office Duplicators; and Graphic Arts Production and Management Problems. Sample assignments sheets are included.

1366. MOORE, LESLIE A. *A Proposed Program of Graphic Arts for Kirby-Smith Junior High School, Jacksonville, Florida.* M. Ed., 1952, University of Forida. 118 p. Library, University of Florida, Gainesville.

Purpose: To revise and expand the present limited graphic arts curriculum so that it will provide exploratory experiences, essential introductory information, and limited graphic arts skills.

Source of Data: Data were gathered from experience as an industrial arts teacher, consultation with other teachers, and study of technical and professional publications.

Findings and Conclusions: The proposed course should result in a richer and a more varied selection of exploratory experiences than has been provided for them in the past.

1367. NORD, RAYMOND V. (M. A.). *Junior High School Printing.* University of Minnesota, 1937. 101 p.

A list of 129 instructional units (type jobs, units of information, units of operations) in junior high school printing placed in rank order from high to low, according to the experience and opinions of twenty-five teachers of junior high school printing.

1368. NOREEN, HAROLD M. *Printing as One of the Industrial Arts Courses in the Beloit Memorial High School.* M. S., 1953 Oklahoma Agricultural and Mechanical College. 63 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To provide an account of the printing courses in Beloit Memorial High School in Beloit, Wisconsin, together with a history of printing and a review of the processes common to the trade today.

Source of Data: Data were obtained from school records, textbooks, and magazine articles.

Findings and Conclusions: It is concluded that both printing and industrial arts contribute significantly to a complete general education for a group of students in the Beloit Memorial High School.

1369. OLFORD, GEORGE W. *Occupational Information for Vocational Printing Students.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 86 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile available occupational information for vocational printing students.

Source of Data: Data were obtained from government bulletins, textbooks, and interviews with persons in the printing industry.

Findings and Conclusions: The variety of jobs in the printing industry make employment possible with almost any type of education and physical ability. Opportunities are very good for students with special talent. The trade offers a chance for steady employment in one of the world's largest industries.

1370. OLIVER, ARTHUR RAYMOND (M. S.). *The Silk Screen Process in the Graphic Arts Program.* Ohio State University, 1940. 80 p.

A description of the methods of making the frames, benches, and other equipment necessary for printing by the silk screen process. It includes a description of the printing process and samples of printing in single colors and in multiple colors.

1371. PRUST, ZENAS A. *Assignment Sheets for Ninth Grade Printing.* M. A., 1951, University of Minnesota. 80 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop and interpret individual instruction sheets.

Source of Data: Data were obtained from books, magazines and experience.

Findings and Conclusions: The report includes a set of activity assignment sheets for ninth grade printing.

1372. QUANBECK, ARON. *An Analysis of the Distinguishing Characteristics of Specific Type Faces.* M. A., 1953, Colorado State College of Education. 154 p. Library, Colorado State College of Education, Greeley.

Purpose: To develop a plan for studying type face design that will aid the student in recognizing type.

Source of Data: Data were obtained from a review of the literature and from observation and analysis of type faces.

Findings and Conclusions: There are countless minute variations in the details of type that make up the finished designs. In the Roman type group, the capital letters A, E, J, M, P, Q, and W provide the best clues to identification. Other characteristics of design useful in distinguishing type are the character of the serifs, the color value of the type, the contrast in weight between thick and thin elements, and the length of ascenders and descenders of lower-case letters.

1373. RANDALL, CLARA L. (Masters). *School Subject Areas Desirable in Preparing for the Printing Trade.* University of Michigan, 1943.

1374. RICE, ROBERT C. *A Proposed Course of Study in Printing for the Parker High School, Birmingham, Alabama.* M. A., 1949, Ohio State University. 54 p. Education Library, Ohio State University, Columbus.

Purpose: To provide a variety of experiences in the letterpress printing phase of the graphic arts industry which will enable students to meet the requirements for entering the industry as advanced learners.

Source of Data: Printing courses in the Tuskegee Institute Laboratory High School and the Alabama Agricultural and Mechanical College Laboratory High School were analyzed to determine their scope, character and facilities. Questionnaires were sent to Negro printing firms in the South to ascertain their needs with respect to Negro printers.

Findings and Conclusions: Data secured shows there is a demand for Negro printers in the territory to which inquiry blanks were sent. It is recommended that Negro institutions offering letterpress printing make such changes in their curricula as may be necessary to provide printers competent to fill the positions now available in the industry.

1375. SIESSEL, FOREST D. (M. S.). *Analysis of Related Information on Printing for Students of Industrial Education.* Iowa State College, 1941. 57 p.

A study to find the relative emphasis and time given various topics or related information in connection with printing.

1376. SMITH, WARREN G. *Instructional Materials for Basic Graphic Arts.* M. A., University of Minnesota, 1948. 141 p.

A guide for instructors with details of instructional materials on paper making, block printing, silk screen work, varied duplication processes, and book binding.

1377. STURM, RAYMOND W. (M. S.). *Graphic Arts Activities in the Industrial Arts Curriculum.* The Stout Institute, 1939. 183 p.

An investigation of the fields of printing, duplicating, and related graphic arts to determine their adaptability to instruction in an industrial arts curriculum. Data were based on a survey of the literature, interviews, correspondence, and government codes.

1378. TOSKY, MILT F. *Competency Tests For Printing, Teachers in Service or Prospective Printing Teachers.* M. Ed., 1950, University of Cincinnati. 156 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To develop a competency test for printing teachers.

Source of Data: Data were obtained from literature on trade competency tests, questionnaires, personal letters, and trade analysis of the printing trades.

Findings and Conclusions: Two forms of the printing tests were constructed, based on trade content and approved test construction techniques.

1379. VOSBURG, ELMER (Masters). *A Study of the Vocational Industrial Courses in Printing in the State of Pennsylvania.* University of Pennsylvania, c. 1935–47.

1380. WAGNER MERLIN R. (M. S.). *A Course of Study in Printing for the Public Schools.* Oregon State College, 1933. 102 p.

A suggested program of printing education for secondary schools, based upon an analysis of the printing industry and the opportunities for the correlation of printing instruction with other high school subjects.

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1381. WEIR, THOMAS STEPHEN. *A Graphic Arts Program at the Collegiate Level.* Ed. D., 1955, Oregon State College, 157 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain content areas in graphic arts for the technical preparation of industrial arts teachers.

Source of Data: Data were secured from state guides, catalogs, college programs, and a questionnaire survey of 201 educators and industry representatives.

Findings and Conclusions: Graphic arts course content should be broadened to include many areas that are not now included. Primary emphasis should be placed on such aspects as planning, design and color, functional English, and broad understandings of graphic reproduction processes, with skill training integrated. Courses should be taught in a general setting rather than as parts of the whole.

1382. WHITE, WILLIAM V. *Determining Curricular Needs in Graphic Arts at Ilinois State Normal University.* M. S., 1952, Illinois State Normal University. 46 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the type of training needed by prospective teachers of printing so that they might receive the experiences, methods, and procedures which will make them effective in their work.

Source of Data: Data were gathered by a questionnaire sent to industrial arts printing teachers in Illinois.

Findings and Conclusions: The graphics arts courses at Illinois State Normal University should increase the number of fundamental skills in letter-press printing and increase the opportunity for acquiring knowledge of the many phases of graphic arts and allied trades. An opportunity for acquiring experiences in evaluating production jobs that conform to the level of ability of high school students is needed.

1383. WILLIAMS, GEORGE H. *Outline and Content for a Course in Applied Print Shop Mathematics.* M. S. in Ind. Ed., Kansas State Teachers College, 1940. 26 p.

A course of study in applied mathematics for printers.

1384. WILLIAMSON, DWIGHT A. *Printing As A Unit in the General Shop in the Oklahoma Schools.* M. S., 1951, Oklahoma Agricultural and Mechancal College. 63 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To justify the inclusion of printing in an industrial arts course which emphasizes general education.

Source of Data: Data were obtained from books and magazine articles.

Findings and Conclusions: Providing the objectives are observed as desired goals for the student, a printing course in industrial arts can be considered as a portion of general education.

1385. WINNEMORE, AUGUSTINE EDWARD (M. A.). *An Industrial Arts Course of Study in Printing for the Senior High School.* University of Maryland, 1948. 127 p.

A description of a two semester course of study in printing including the aims and objectives of the course. Problems to accompany the shop work and related material are presented with suggestions for teaching printing.

1386. WOODBURN, LOWELL NORVIEL (Masters). *Practices in Secondary School Printshops.* University of Chicago, 1938.

Handicrafts

1387. ATTILIO MAURICE DeGASPARIS (M. S.). *A Course of Study in Jewelry Making.* University of Southern California, 1942.

1388. BARBOUR, HARRY F. (M. S.). *A Course in Crafts for the Multiple Shop Classes in the Junior High Schools of Kansas City, Missouri.* Colorado Agricultural & Mechanical College, 1940. 75 p.

The development of a course in crafts for the general shop class in junior high school. Each craft is analyzed to determine its specific value in general education. The report includes suggested learning units, lesson plans, suggested projects, and a bibliography of crafts.

1389. BEAN, LEWIS. *Handicrafts Adaptable to the Ozark Region of Eastern Oklahoma.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 47 p.

A study giving a description of the situation prevailing in the Ozark Region of Eastern Oklahoma, and presenting the accomplishment of this region in the use of handicrafts or small home industries.

1390. BENSHETLER, CHARLES J. *An Investigation of Handicrafts As Related to Industrial Arts with Emphasis on Wood.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 66 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain what wood-crafts are suitable for use in industrial arts as a part of the general education program and to discover phases of hand woodwork which have contributed to handicrafts in industrial arts.

Source of Data: A survey was made of literature pertaining to the problem. Operations used in carving, whittling, punching and piercing were analyzed. Selected projects were tested by using them in the instruction of a group of students.

Findings and Conclusions: Wood-crafts can be used in industrial arts courses as a part of general education. Certain operations, particularly those in wood carving, are applicable to industrial arts instruction.

1391. BERNARD, FRANCIS MONTGOMERY (M. S.). *Development of Expressional Handcraft in the Long Beach Elementary Schools.* Oregon State College, 1941. 107 p.

An attempt to improve handcraft training in grades three through six. Both administrative and teaching problems are considered. Findings include bibliography materials for use in the classroom and plans for units of instruction.

1392. BLAINE, VIRGIL L. *Suggested Course of Study in Ninth Grade Crafts for Kansas City, Missouri, Public Schools.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 134 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To survey the needs and desires of ninth grade students, to construct a suggested course of study in crafts, to enlarge the crafts program as it affects the Kansas City schools.

Source of Data: Questionnaires to students covering types of projects desired. Personal interviews and survey of the situation in Kansas City with reference to crafts teaching.

Findings and Conclusions: A course of study was developed embodying the objectives, the operations, things to know, materials, tools and machines, suggested projects, demonstrations, class discussions, teaching aids and devices, job assignments and other instructional sheets for the areas of leathercraft, plastics, metal tooling, and wood carving.

1393. BOSWELL, CLIFFORD EDWIN (M. S.). ***A Study of Handicrafts in Junior Colleges of The Western States, with Particular Reference to Objectives and Content.*** **Oregon State College, 1948. 86 p.**

A survey of the practices regarding handicrafts for terminal education in junior colleges and adult education in eleven western states. Most popular crafts in the west are determined and suggestions are made for the improvement of present craft courses.

1394. BOTTOMS, BERRY (M. S.). ***A Study of the Crafts Courses Taught in the Junior High Schools of Amarillo, Texas.*** **East Texas State Teachers College, 1940. 133 p.**

A descriptive study of the crafts courses offered in the Amarillo, Texas, Junior High School in 1940. The possibilities of a crafts program are pointed out and a course is recommended.

1395. BOWERS, RALPH W. E. (M. S.). ***Teaching Units in the Craft of Brushmaking.*** **Iowa State College, 1941. 59 p.**

A review of the history of brushmaking, materials used in making brushes, sources of these materials, and the operations included in making a brush. A course outline of construction units involved in the actual making of a brush is given.

1396. BRENHOLTZ, GERALD S. ***An Analysis of the Function of Handicrafts in Education for Life Adjustment Situations.*** **M. S., 1949, North Texas State College. 66 p. Library, North Texas State College, Denton.**

Purpose: To analyze the handicrafts program to find its function in education for life adjustment situations.

Source of Data: The data were obtained from recent writings in the fields of education for life adjustment situations; books on the psychology of learning; general education, and from studies dealing with crafts in the school.

Findings and Conclusions: Handicrafts fill an important place in education for life adjustment; afford better living conditions in the home; afford an opportunity to explore many new materials; leisure time activities; problem solving, and creative designing. The general craft shop is recommended.

1397. BURRIS, SCHUYLER M. ***A Proposed Course of Study in Arts and Crafts for Secondary Schools.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1940. 159 p.**

Comprehensive lists of supplies, tools, materials, and written instructions on projects; includes leathercraft, art metalcraft, and plastics.

1398. CARMICHAEL, IDA B. (Masters). ***Craft Work as an Early Educational Force and Its Present Status in Secondary Education.*** **University of Cincinnati, 1932.**

1399. CONWELL, THOMAS HARDEN. ***Ceramics—A Projection of a Program in Industrial Arts Education.*** **M. Ed., 1955. The Ohio State University. 42 p. Library, The Ohio State University, Columbus.**

Purpose: To assemble information and operations for an elementary ceramics unit in an industrial arts laboratory.

Source of Data: Data were obtained from an examination of textbooks and pamphlets and direct observation and examination of industrial processes and practices.

Findings and Conclusions: Information is included on the properties, types, uses, and preparation of the common clays, and on design, decoration, glazes, supplies, and equipment.

1400. DAHL, GWEN M. (M. A.). ***Some Opinions Concerning the Handcrafts in General Education.*** **George Peabody College, 1941. 75 p.**

The history and development of handcrafts with emphasis on the present status of handcrafts in general education. Suggestions are given regarding the teaching of handcrafts, and consideration is given their contributions to general education.

1401. **DEGASPARIS, A. M. (M. S.).** *A Course of Study in Jewelry Making.* **University of Southern California, 1940. 135 p.**

A study aimed to make jewelry making more attractive in the school curriculum by laying out a course of study.

1402. **DEVETTE, WILLIAM A. (Masters).** *Educational Aspects of the Dutch Craft Guilds.* **University of Pittsburgh, 1931.**

1403. **FITSPATRICK, DOROTHA CHAFFEE (Masters).** *Mexican Crafts in Relation to Related Arts in the Calexico Public Schools.* **Oregon State College, 1939. 89 p.**

1404. **GODARD, LAUREN FRANCIS.** *Selected Phases of England's Arts and Crafts Program Applied to Industrial Arts in the United States.* **M. A., 1952, Oregon State College. 147 p. Library, Oregon State College, Corvallis.**

Purpose: To learn what industrial arts techniques and methods used by English craftsmen are applicable to the teaching of woodworking and metal crafts in the American industrial arts program.

Source of Data: Data were secured by study at Central School of Arts and Crafts, London, England, interviews, visits to schools and trade establishments, and books.

Findings and Conclusions: Hand processes still remain the foundation for beginning students in England. Much can be gained if industrial-arts teachers study the historical and contemporary methods used by English craftsmen. The report describes school shop plans and programs used in a typical London craft school.

1405. **GREEN, MARSHALL DANNY.** *A Study of Lapidary as Part of the Industrial Arts Program.* **M. Ed., 1950, Agricultural and Mechanical College of Texas. 18 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.**

Purpose: To ascertain the place of lapidary as a part of industrial arts program, and to find out which activities are best suited to lapidary work in schools.

Source of Data: A survey of literature was made to ascertain the suitability of lapidary for industrial arts, and lapidary work was studied to ascertain its cost and the operations suitable for an industrial arts program. The findings of the study were evaluated by teaching the operations selected to a class.

Findings and Conclusions: Lapidary work is applicable to industrial arts as outlined in the study. Gem cutting is economical and offers challenging activities in the industrial arts shop.

1406. **HANSEN, LAWRENCE CHARLES Jr.** *The Utilization of the Industrial Arts Shop for Hobby and Craft Purposes.* **M. A., 1954, University of Minnesota. 79 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To compare two methods that have been tried and could be used to bring about a hobby craft program during the school day; to acquaint those who are interested in setting up a hobby program with the necessary tools, materials, and suppliers of materials.

Source of Data: Data were collected from books on various hobbies, catalogues of manufacturers and suppliers of materials, and an interview.

Findings and Conclusions: Hobby and craft work provides an opportunity to develop an appreciation of excellent workmanship. Industrial arts should be expanded to provide for more exploration in the junior high schools.

1407. **HODGES, SIDNEY CECIL.** *Handicrafts in Sevier County, Tennessee.* **M. S., 1951, University of Tennessee. 74 p. Library, University of Tennessee, Knoxville.**

Purpose: To trace the handicraft practices in Sevier County from pioneer days to 1951.

Source of Data: Data were secured through personal visitation and questionnaire.

Findings and Conclusions: Handicrafts that have persisted through the years and are still affording sources of income are weaving and basket making. Weaving, pottery, and custom built furniture from native woods are the handicrafts now produced in the greatest volume. The Craftsman's Fair of the Southern Highland Handicraft Guild has helped to arouse public interest in the old crafts and has encouraged local craftsmen to continue their efforts.

1408. **HOLLOWAY, JESSE C.,** *Jr. Design and Procedures for Art Carving Leather.* M. S., 1951, Oklahoma Agricultural and Mechanical College, 46 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To examine available literature on art carving of leather and present supplementary material on this craft.

Source of Data: Data were obtained from books, reports, and magazines.

Findings and Conclusions: Present publications give little information on the designing, assembly, and structure of art carved leather projects. There is a need for new methods of decoration and surface enrichment.

1409. **HOPPER, JOHN HOWARD.** *Craftwork as a Means of Meeting the Needs of Problem Boys of Junior High School Age in Our Public Schools.* M. A., Kent State University, 1942. 102 p.

A study of craftwork and its part in meeting the needs of the problem boy. Approximate time concentration was from 1900–1940.

1410. **HUTCHENS, SUSAN ELIZABETH** (M. A.). *The Program of Appalachian American Crafts at Berea College.* George Peabody College, 1937. 98 p.

A description of the development of the woodwork, weaving, and smaller crafts programs at Berea College as of 1937. The occupational value of such programs is considered.

1411. **KEE, JIM W.** (Masters). *Developing and Evaluating a Course in Crafts in a Small School.* North Texas State Teachers College, 1941.

1412. **KIRK, EARL** (M. A.) *Place for Wicker Weaving in an Industrial Arts Program.* George Peabody College, 1930. 126 p.

An analysis of operations, operation sheets, public schools, and colleges offering weaving in an effort to determine the relative importance of wicker weaving in the industrial arts program.

1413. **KNIGHT, ROBERT E.** *Basic Operations in the Prefabrication of Leather Projects and the Construction and Uses of Leathercraft Tools.* M. S., 1951, North Texas State College. 86 p. Library, North Texas State College, Denton.

Purpose: To ascertain the use being made of homemade tools for leatherwork, and to examine the possibilities of making a part of the tools and equipment needed in leathercraft classes.

Source of Data: Data were secured from studies in the leathercraft field, textbooks, personal interviews, and a questionnaire.

Findings and Conclusions: Seven per cent of the schools included in the survey made their own leather stamps; fifty per cent intended to do so in the near future; and seven per cent had discontinued leathercraft because of the cost of equipment and leather.

1414. **MANLY, J. R.** (M. S.). *A Course in Art Metal for Southwest High School.* Colorado Agricultural & Mechanical College, 1939. 63 p.

A course of study in art metal. The units in the course include: (1) the objective (teaching), (2) content, (3) teaching suggestions, (4) evidence of desirable progress, and (5) bibliography.

1415. **MARTIN, ALBERT.** *Handcrafts Course of Study for the 8th Grade at Austin High School, El Paso, Texas.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 75 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To provide a course of study in plastics and leathercraft for the junior high school shop.

Source of Data: Data were secured from books, periodicals, bulletins, and handbooks.

Findings and Conclusions: The junior high shop should be converted to a composite general shop to include instruction in: wood, sheetmetal, drawing, leather, and plastics.

1416. **McALLISTER, RAYMOND S.** *The Nature of Ceramics in the Handcrafts.* M.Ed., 1950, Agricultural and Mechanical College of Texas. 64 p. Department of Industrial Education, Agriculture and Mechanical College of Texas, Arlington.

Purpose: To determine the nature of ceramics in the handcrafts, to construct, use, and rewrite a unit of study in ceramics, and to list sources of available information, supplies, and materials that might be helpful to a teacher offering ceramics as a part of his handcraft program.

Source of data: A survey was made of related literature to ascertain the objectives of industrial arts and general education. An instructional unit in ceramics was prepared and tested by using it in teaching members of a class.

Findings and Conclusions: Certain ceramic activities are profitable in handcrafts. Projects and related information appropriate for these ceramic activities were developed.

1417. MEDLIN, JACK T. *Thong Projects Applicable to Leathercraft.* M.Ed., 1951, Agricultural and Mechanical College of Texas. 53 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To assemble and describe thonging projects applicable to leathercraft courses, and to determine the suitability of these projects as regards to cost and manipulation.

Source of Data: Data were secured from books and periodicals.

Findings and Conclusions: Thonging projects are easy to make, are comparatively inexpensive, and produce satisfactory results. The beginning leatherworker would have little difficulty in learning the methods and techniques necessary to make good thonging projects.

1418. MONICAL, URBAN LOWELL (M.A.). *Hand-Looms: Their Development, Structure, and Operation.* Ohio State University, 1938. 170 p.

An historical development of hand-looms based on data gathered from literature, museums, and private collections. The underlying principles of weaving are considered, with emphasis on modern methods of cloth production. Pictures of materials and processes are included.

1419. NAIR, RALPH K. *Suggested Crafts Curriculum, Westport Junior High School, Kansas City, Missouri.* M. S. in Ind. Ed., Kansas State Teachers College, 1939. 122 p.

A crafts curriculum proposal covering physical layout, course content, methods of instruction, pupil-personnel organization, tools and equipment, shop library, and records and forms.

1420. NICKELSON, ARTHUR W. (Masters). *The Development of a Unit of Silversmithing for Junior High School Pupils.* Arizona State Teachers College, 1942.

1421. NORRIS, LONNIE (M. S.). *Leathercraft Which May Be Applied in the Industrial Arts Program of Junior and Senior High Schools.* North Texas State College, 1947. 63 p.

A description of leathercraft as an activity in the industrial arts program of junior and senior high schools.

1422. OLIPHANT, ALVA WAYNE (M. S.). *Lapidary Work as a Medium of Instruction for the Industrial Arts Program.* Oregon State College, 1948. 146 p.

A nationwide survey of present practices with lapidary work in secondary schools and colleges, including judgments as to the worth of the activity. Analysis of costs of equipment and some historical lore are included. Half the study is an illustrated, suggested set-up of lapidary equipment and a description of the activities.

1423. ORR, ELIZABETH M. (Masters). *A Survey and Analysis of the Present Status of the Curriculum and Methods Used in Teaching Craft Work in the High Schools of Kansas.* Colorado State College of Education, 1942.

1424. PERRY, HOWARD S. *The Nature of Art Metal in Handicraft.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 26 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain the nature of art metal work in handicrafts.

Source of Data: The literature was surveyed to ascertain a clear definition of handicraft and the nature of art metal work. Art metal activities were analyzed and the appropriateness of the activities selected was studied as they were taught to a class in handicrafts.

Findings and Conclusions: The following units of art metal were considered applicable to handicrafts: Tooling, etching, planishing, piercing, and beating down.

1425. PRICE, LEONARD A. ***Beginning Course in Leather Tooling.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1940. 73 p.**

A course of study in leather tooling, including working drawings on written instruction.

1426. RICHARD, VALEX. ***Louisiana Acadian Handicrafts.*** **M. S. 1951, Louisiana State University. 70 p. Library, Louisiana State Universary, Baton Rouge.**

Purpose: To give an account of the handicraft work done by the Acadians who settled in southwestern Louisiana.

Source of Data: Data were obtained from personal visits to the Acadian country, observing Acadian craftsmen at work, inspecting equipment, interviewing General Extension Acadian Handicraft Officials, and from photographs of various phases of Acadian crafts.

Findings and Conclusions: In the area studied, between 40 and 50 people work under the supervision of the Louisiana State University General Extension Field Representative. All Acadian handicraft articles are sold under a registered label. The materials for the handicraft articles are grown locally. Very little machinery is used. The handicraft work is done strictly as a leisure time activity with no regular work hours reported.

1427. ROLSTEN, HERBERT E. (M. A.). ***Leather: Its Nature and Place in an Industrial Arts Program.*** **Ohio State University, 1937. 108 p.**

A study of leather from pre-historic times to the 1937 developments in synthetic leathers. The information is so presented as to permit the development of a curriculum on this subject.

1428. SCOTT, WARREN RICHARD. ***How To Use Local Clays in School Ceramics.*** **M. Ed., 1952, Central Washington College of Education. 77 p. Library, Central Washington College of Education, Ellensburg.**

Purpose: To assist the ceramics teacher in experimentation with local clays.

Source of Data: Data were obtained from books, technical literature, and experimentation.

Findings and Conclusions: Local clays can be utilized in school ceramics with a minimum amount of expense and equipment.

1429. SHILL, GEORGE R. (Masters). ***Handicrafts in the Grant and Lowell Elementary Schools of Phoenix, Arizona,*** **Arizona State Teachers College, 1942.**

1430. SMITH, HARRY LEE. ***Leathers Employed in the Teaching of Industrial Arts Leathercraft Courses.*** **M. S., 1949, Oklahoma Agricultural and Mechanical College. 90 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To assemble original data about leathers.

Source of Data: A study of both catalogs and books on leather and leather working.

Findings and Conclusions: In this technical report an attempt has been made to find complete information about those leathers adaptable for various uses in the teaching of leathercrafts courses. The selection of leathers to fit particular jobs is very important in craft work. The report includes definitions of terms as well as information about descriptions of manufacturing processes. Eighteen kinds of leather are studied in great detail.

1431. SWEITZER, RICHARD LAYAN. ***Application of Handicrafts in the Agricultural and Mechanical College of Texas Student Memorial Hobby Shop.*** **M. Ed., 1950, Agricultural and Mechanical College of Texas. 59 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.**

Purpose: To ascertain whether avocational hobbies have been valuable to college Student Center programs, to find out how other schools have organized such programs, and to organize a program for the hobby shop at the Memorial Student Center at the Agricultural and Mechanical College of Texas.

Source of Data: Related literature was surveyed to find out what handicrafts were desirable for hobby shops, the hobby programs of other schools were studied, and literature from manufacturers was examined for the purpose of selecting appropriate tools and materials. The aims of the Memorial Student Center were reviewed and a proposed program, including tool and material test, was submitted to officials of the Memorial Student Center for evaluation.

Findings and Conclusions: The study reveals that hobbies are of value and are applicable to the Memorial Student Center. A program was organized including work in leather, ceramics, plastics, radio silk screen and linoleum block printing, wood carving and whittling, model making, and art metal. Lists of materials and equipment required for a hobby shop were prepared.

1432. TAYLOR, G. MANSON (M. Ed.). *Current Practices Regarding Craft Courses Offered in United States Colleges of Education.* Wayne University, 1944. 66 p.

An analysis of the courses given to potential teachers of craftwork for the years 1941 and 1942. Suggestions are given regarding courses that should be offered to enrich teacher education curricula.

1433. UCHIMA, CHARLES. *A Proposed Craft Course of Study for Waimea High School—Hawaii.* M. S. in Ind. Ed., Kansas State Teachers College, 1948. 97 p.

The study proposes a craft program for Hawaiian children with a view to developing a greater appreciation for native crafts.

1434. WELSCH, CALVIN R. *Lapidary in the Industrial Arts Program.* M. Ed., 1953, Wayne University. 84 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To assemble information about lapidary which would be helpful to industrial arts teachers in integrating this craft into the curriculum.

Source of Data: Data were obtained from experiences in private instruction, laboratory work, and research.

Findings and Conclusions: A list of tables, lapidary supply companies, sources of information for every state of the union, illustrations of the writers collection of cabochons, conversion of equipment, essentials for starting lapidary in a school shop, and an annotated bibliography were developed.

1435. WILBER, GORDON G. (Masters). *Pewter as a Subject of Study: With Particular Reference to Its Use in the Arts and Crafts Program of the Laboratory of Industries.* Ohio State University, 1936.

Home Mechanics

1436. AU CLAIR, ERNEST E. *Lesson Plans for an Integrated Course in Home Mechanics and Craft Work.* M. S. in Ed., 1948, Cornell University. 97 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To write a set of lesson plans for an integrated course in home mechanics and craft work.

Source of Data: Library research.

Findings and Conclusions: Objectives, tools and materials, teaching aids, procedure, questions and references are included for 97 lesson plans in home mechanics and craft work.

1437. BASS, ROBERT A. *The Significance of Home Maintenance and Improvement Activities for Industrial Arts Based on Negro Homes in Pittsburg, Kansas.* M. S., 1953, Kansas State Teachers College. 57 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To study the types of jobs performed, the tools and equipment possessed, the occupations and the industrial arts experiences of ninety-nine Negro householders in Pittsburg, Kansas, to ascertain the significance of home maintenance and improvement for industrial arts education.

Source of Data: Data were secured directly from the families by interview. Check lists of jobs, tools, and equipment were used.

Findings and Conclusions: Those persons with previous training, of an industrial nature, had been able to perform more jobs and possessed more tools than those having no training, thus adding to their income by doing many of the home maintenance and improvement jobs.

1438. BATTENSLAG, FRED G. (M. A.), *Home Mechanics Based on Home Repairs in Asheville, N. C.* George Peabody College, 1931. 61 p.

A study of the home repairs that may be done in school workshops as a core for industrial arts study. A check list as well as a planned course of study are included for a program of this type.

1439. BOTTENSLOG, FRED G. (Masters). *Home Mechanics Based on Home Repairs in Asheville, North Carolina.* George Peabody College, 1931. 61 p.

1440. **BRIDGES, GAYLORD PAUL.** *Parents' Opinions Concerning Home-Repair Education.* M. S., 1952, Illinois State Normal University. 70 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the needs in home repair and the desires of parents for home-repair education for both boys and girls.

Source of Data: Data were obtained by a questionnaire sent to parents.

Findings and Conclusions: Since from 40 to 80 percent of the parents desire training in all 90 home repair jobs listed, it would appear that the school should furnish this training. Only 20 of the 90 repair jobs listed were checked by over 10 percent of the 180 parents as "desiring training for girls." There was not enough demand for the training for girls to justify offering home repair education to girls in areas other than repair of furniture and electrical wiring and appliances.

1441. **GARNAND, SIDNEY F. (M. S.).** *A Study of Procedures in Establishing a Home Mechanics Course for Towns of the Type of Garden City, Kansas.* Colorado Agricultural & Mechanical College, 1933. 80 p.

A course in home mechanics for the Garden City, Kansas, schools.

1442. **GUSTAVSON, GEORGE (M. A.).** *A Course in Home Making for Boys.* University of Denver, 1931. 74 p.

Analysis of replies to a questionnaire consisting of 264 suggested items, under twenty-one such headings as carpentry, plumbing, electricity, safety measures, and first aid, to be checked to determine what should be included in a homemaking course for boys at the secondary level.

1443. **HOLMES, ROBERT RUSSELL.** *A Suggested Offering in Household Maintenance Suited to an Industrial Arts Program.* M. Ed., 1953, University of Florida. 98 p. Library, University of Florida, Gainesville.

Purpose: To develop a suggested offering in household maintenance for a high school industrial arts program.

Source of Data: Data were secured from surveys, visitations, and contacts with corporations.

Findings and Conclusions: Household maintenance operations should be a part of the industrial arts program. It should help the average wage earner augment his own income by avoiding costly repairs. An appreciation of good workmanship can be developed in the student through the study of home maintenance problems.

1444. **HOLSINGER, JAMES L.** *Home Work-Shop Activities As Reflected in the Catalogues of Sears and Roebuck and Company.* M. A., University of Minnesota, 1947. 121 p.

A study of instructional assignments in industrial arts areas suggested by offerings of a sales firm, and their relationship to the home work-shop activities.

1445. **LE GRESLEY, LEON R.** *Home Mechanics for the Rural High Schools of Kansas.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 92 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To establish objectives for a course in industrial home mechanics, to suggest methods for coordinating home and shop, and to recommend instructional units.

Source of Data: Data were obtained from a review of the literature and from questionnaires sent to 115 ninth grade boys in rural schools in Kansas.

Findings and Conclusions: The eleven objectives of home mechanics selected deal with the development of personal-social traits, attitudes, and manipulative and planning skill. The coordination of work in the home and shop can be improved by parents reporting to the teacher those jobs done at home. Instruction in home mechanics should include automobile work, electrical, painting and refinishing, plumbing, woodwork, general repair and upkeep of home, metalwork, care and repair of tools and equipment, and safety.

1446. **LEMBRIGHT, WALTER F.** *Evaluation of the Seventh Grade Home Mechanics Course in Dayton, Ohio.* M. A., Kent State University, 1948. 56 p.

An evaluation of a seventh grade home mechanics course for the purpose of making recommendations for its improvement.

1447. **RUSSELL, RALPH R.** *Home Mechanics for Seventh Grade Boys and Girls in Lakeside Junior High School, Pittsburg, Kansas.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 70 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To develop a course in home mechanics for boys and girls at the Lakeside Junior High School, Pittsburg, Kansas.

Source of Data: Survey of Lakeside School; parents and students were interviewed.

Findings and Conclusions: Aims and objectives, organization of classes, classroom procedure, and suggested content of course are presented. Extensive use of the written instructional technique is presented.

1448. SCHULTZ, LEO CARL (M. A.). *The Place of Home Mechanics in the Junior High School Curriculum.* State University of Iowa, 1930. 50 p.

A course of study in home mechanics as developed from a survey of families in Cape Girardeau, Missouri, and Cairo, Illinois.

1449. SCHULTZ, LOUIS JOSEPH (M. A.). *The Mathematics of Home Mechanics.* State University of Iowa, 1931. 68 p.

A study of the place and importance of mathematics in the home mechanics courses in junior high school.

1450. SHELBY, ROBERT B. *Development of a Course of Study in Home Mechanics Through the Questionnaire Interview Technique.* M. Ed., 1950, University of Cincinnati. 101 p. Library, University of Cincinnati, Cincinnati, Ohio.

Metal Work

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1453. ANDERWALD, CARL JOSEPH (Ph. D.). *National Defense Training Program for Pre-Employment Machine Shop Practice in Central New York State.* Cornell University, 1947. 306 p.

A study of the contributions to industry and vocational education made by the War Industries Training Program in central New York with implications for future planning in the field of vocational education. The administration, supervision, and organization of twenty-three pre-employment National Defense Training machine shop programs are discussed.

Purpose: To develop a course of study in practical home mechanics suitable for use in either a junior or senior high school.

Source of Data: Data were secured through a questionnaire sent to the parents. Items for the questionnaire were selected from home mechanics course of studies, magazine articles, textbooks, and general shop publications.

Findings and Conclusions: The report contains the significant items derived from the survey form.

1451. VAN DUESEN, LOWELL. *Place of Industrial Arts in the Development of the Home Workshop.* M. A., Kent State University, 1940. 107 p.

A study of the home workshop of boys in a junior high school in order to investigate their effect in industrial arts.

1452. VAUGHN, JOHN HENRY. *Home Mechanics For the Negro Schools of Oklahoma.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 108 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To establish a procedure for making a course of study to meet the needs of Negro communities in Oklahoma.

Source of Data: Data were obtained from an analysis of home repair and maintenance jobs, and from books, magazines, and interviews.

Findings and Conclusions: The curriculum should include units of instruction which would promote economy in the home and develop ability along mechanical lines.

1454. ARDUSSE, JOHN R. *An Evaluation by Student Machinists and Patternmakers of Factual Matter Taught in Related High School Chemistry.* M. A., University of Michigan, 1938. 96 p.

A study showing the implications of needs of vocational and trade students in a particular field for the nature and content of a high-school subject.

1455. BARNHARD, CLYDE M. (Masters). *Development and Evaluation of an Elementary Machine Work Course in the Industrial Arts Program.* Ohio State University, 1937.

1456. **BARTLETT, CARL M. (Masters).** *Development and Evaluation of an Elementary Machine Work Course in the Industrial Arts Program of the Junior High School with Special Reference to Roosevelt Junior High School, Cleveland Heights, Ohio.* Ohio State University, 1937.

1457. **BASTOW, PAUL GORDON.** *Project Selection for Prospective Industrial Arts Machine Shop Teachers.* M. S., 1954, Oregon State College. 90 p. Library, Oregon State College, Corvallis.

Purpose: To examine the methods and techniques used in the selection and application of machine shop projects.

Source of Data: Data were secured through an information form sent to selected industrial arts machine shop teachers.

Findings and Conclusions: Training in project selection has fallen short of expressed needs. Colleges and universities should help and stimulate teaching candidates in the obtaining of teaching aids. Present practices, project sources and an evaluation of topics are listed.

1458. **BENN, OMER.** *A Proposed Resource Unit in General Metal Work for Wisconsin Schools.* M. S., 1949, The Stout Institute. 92 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To analyze, identify, and select content for making a resource unit in general metal work.

The secondary purposes are: To build a sample resource unit based on the thinking of leaders in the field. To prepare a guide for curriculum planning committees, and an aid for anyone making a course of study or selecting course content.

Source of Data: Reviewed the literature on resource. Studied units in general metal work. Identified, analyzed, interpreted and selected all data.

Findings and Conclusions: A resource unit is a large body of organized material from which the teacher can draw ideas and suggestions for teaching. The material in the resource unit on general metal work is divided into 6 main divisions. The significance of the topic gives the general purposes, specific purposes, and the use of the resource unit. The brief outline of the topic gives a table of contents for the material. The specific objectives for general metal work are stated and justified. The analysis sets down the basic elements of general metal work. Activities are suggested as aids to be used in teaching—suggested evaluation, reasons for evaluation and a sample diagnostic test. The following recommendations are suggested by the writer: This resource unit be submitted for evaluation and use by the Statewide Industrial Arts Committee of the Wisconsin Cooperative Educational Planning Program; that it be submitted to shop teachers for evaluation and suggestions; that a study be written on sources and kinds of visual aids available for metal work; that the analysis be expanded and contain breakdown sheets and instruction sheets for the operations and that all the informational units have breakdown sheets; that study be made on the evaluation section of the resource unit.

1459. **BENSON, WILLARD A.** *A Resource Unit for Machine Shop.* M. S., 1949, The Stout Institute, 77 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To determine what information should be included in resource units for machine shop.

Source of Data: The writer analyzed the trade to determine the scope of these units.

Findings and Conclusions: Sample resource units for manipulative work, technical, guidance, and general information were developed. Recommendations for the organization, the up-keep, and the use of resource units were made. Qualities inherent in the good organization of resource units include: Flexibility, accessibility, durability, provisions for expansion and revision, logical order, simple organization, facilities, location, provisions for up-keep and expansion.

1460. **BLIEM, W. S. (Masters).** *A Study to Determine the Desirable Outcomes of a Course in Related Machine Shop Practice for Vocational Students in Automobile Mechanics.* Universitv of Pennsylvania, c. 1935–47.

1461. **BLOOM, RAYMOND ROLL (Masters).** *The Relation of Motion Study to Machine Tool Design.* Pennsylvania State College, 1942.

1462. **BOLLINGER, J. W. (M. S.)** *Elementary Foundry Work,* Colorado Agricultural & Mechanical College, 1933. 99 p.

A review of the various steps of typical foundry practices. The elementary projects are graded and are within the range of the ability of junior high school students.

1463. BOWMAN, HARRY R. (Masters). ***A Program of Metalwork for the Industrial Arts School in Sandusky, Ohio, Based on School Purposes and Educational Needs of the Students.*** **Ohio State University, 1938.**

1464. BRIERLEY, R. G. (M. S.). ***A Course in General Metalworking for Birmingham, Michigan.*** **The Stout Institute, 1942. 48 p.**

A survey of sixty metalwork teachers in forty-one states to validate a course of study in general metalworking for Birmingham, Michigan. The value of printed instructional material is considered.

1465. BURKE, SOLOMON M. ***Value of Certain Related Subjects to the Machine Shop Students of the Louisiana Area Trade Schools.*** **M. Ed., 1950, Colorado Agricultural and Mechanical College. 140 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.**

Purpose: To ascertain the value of related subjects to the machine shop students of the Louisiana area trade schools, year 1949.

Source of Data: Sources of data were 10 Louisiana area trade schools, machine shop graduates, machine shop instructors and machine shop foremen.

Findings and Conclusions: More stress should be placed on basic mathematics, speeds and feeds of shop machines, simple gear calculations, figuring belt lengths and sizes, and less emphasis on solving of square root, the functions of angles, and figuring the costs of materials, wages, etc. More practical mechanical drawing and greater emphasis on simple drawings are needed. More functional instruction should be given outside the shop. A system of surveys covering each individual area and giving a continuing picture is needed. A study grouping the shops according to the amount of related information needed would be of some help in setting up courses.

1466. BYRON, ROBERT E. ***Instructional Units for Sheet Metal Apprentices.*** **M. A., 1949, University of Minnesota. 115 p. Library, University of Minnesota, Minneapolis.**

Purpose: To present in initial detail the required skills, knowledges, theory and related information for a course for first year sheet metal apprentices.

Source of Data: Development of a sheet metal trade analysis into 15 instructional units suitable for first year presentation.

Findings and Conclusions: None reported.

1467. CHRISTENSEN, LYNN J. ***Welding in Engineering Curricula.*** **M. S., 1950, Oklahoma Agricultural and Mechanical College, 79 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To investigate the manner in which the accredited engineering schools of the United States are presenting welding to engineering students.

Source of Data: Information was gathered from returned questionnaires which were sent to the Deans of 134 accredited engineering schools.

Findings and Conclusions: The respondents were agreed that mechanical engineering students should be required to take some welding. Welding is most valuable when closely coordinated with courses in metallurgy, machine shop, structural design, and other related courses. A popular method of presenting welding is to combine welding with several other shop courses in a general course. Welding should be emphasized in engineering drawing courses. Several respondents indicated a need for better text material to be used in presenting welding to engineering students.

1468. CLARK, EDWARD K. ***Developing Content of an Advanced Course in Machine Shop Practice for Sandusky High School.*** **M. A., 1948, Ohio State University. 73 p. Education Library, Ohio State University, Columbus.**

Purpose: To develop an advanced machine shop course designed to fit the needs of the senior boys of Sandusky High School who expect to enter any one of the apprenticeable machine shop trades.

Source of Data: An opinion survey of labor and management.

Findings and Conclusions: The pre-apprenticeship machine shop course emphasizes the development of desirable attitudes toward work and fellow workers and the development of acceptable work habits. Many situations are provided that give the students opportunities for cultivating initiative, resourcefulness and exercise of judgment. Command of subject matter and acquisition of skill, although given an important place, are used as a means to an end rather than as ends in themselves.

1469. **CLEMENTS, ARTHUR B.** *Suggested Plan for Preparation of a Resource Unit for General Metals in Wisconsin Schools.* M. S., 1952, Stout State College. 135 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To aid in the preparation of a state bulletin in the general metals area.

Source of Data: Data were gathered by a survey of the literature in the field. A questionnaire was presented to determine the status of general metals in Wisconsin schools and also to secure recommendations from general metals' teachers for desirable content for a general metals course.

Findings and Conclusions: A sample resource unit was prepared which included: significance of general metals, an outline of general metals, possible outcomes of general metals, inventory of possible activities, and evaluation suggestions and materials for reference purposes.

1470. **COLEMAN, RALPH MONROE.** *To Determine a Satisfactory Course of Study in Ornamental Iron Work for Senior High Schools in Terms of Pupil Interests, Home Needs, Good Design, and by an Analysis of the Field.* M. S., North Texas State College, 1939. 56 p.

An analysis of subject matter in the field of ornamental iron and a course of study in terms of pupil interests and needs.

1471. **CONNETT, ORVILLE W.** (Masters). *The Objectives and Machine Tool Equipment for Machine Shop Courses in 30 Illinois High Schools.* Kansas State College, 1940.

1472. **CRANE, LLOYD D.** (Masters). *Determining the Content in General Metal Courses in Secondary Schools.* University of Wisconsin, 1935.

1473. **DRAKE, ROSCOE C.** *Anodizing and Dyeing Aluminum.* M. A., 1952, The Ohio State University. 82 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the feasibility of anodizing and dyeing aluminum in the school shop and to devise equipment and procedures suitable for use in such programs.

Source of Data: Data were obtained from a review of trade bulletins and industrial publications, and visits to metal finishing industries.

Findings and Conclusions: The anodizing and dyeing activity could be carried on successfully by high school students. Equipment was devised to perform these functions on an experimental basis in the industrial arts laboratory.

1474. **DUFFEY, ROBERT M.** (Masters). *Lead as Content for Industrial Arts.* Ohio State University, 1944.

1475. **FAIRBAIRN, HUGH E.** *A Course of Study in Beginning Machine Shop Work at Cloquet, Minnesota.* M.A., University of Minnesota, 1948. 161 p.

A plan for a course in beginning machine shop work on the high school level.

1476. **FERREE, HARLEY M.** *Machine Shop Practice in a Vocational School.* M. A., University of Minnesota, 1944. 219 p.

A report of study and experience in the selection, organization and presentation of machine shop work in Minneapolis, Minn. Boys' Vocational School.

1477. **GEISLER, CHARLES R.** (M.S.). *The Outline of a Related Science Course for Sheet Metal Work in Vocational Schools.* Pennsylvania State College, 1930. 51 p.

A description of a two-year course of study in related science for sheet metal work used in building construction.

1478. **GRIFFIN, FOREST E.** *Analysis and References for a Machine Shop Course.* M.S., 1950, East Texas State Teachers College. 99 p. Library, East Texas State Teachers College, Commerce.

Purpose: To analyze the machinists' trade for the purpose of developing course content, units of instruction and curricula material.

Source of Data: Data taken from references and trade experience and organized into course of study.

Findings and Conclusions: Trade training must be based upon trade analysis and kept up to date. National defense schools during World War II brought a new era of technical and industrial development.

1479. GULDEN, JOHN A. (M.S.). ***Related Mathematics for Trade and Industrial Workers in the Metal Trades.*** **University of Tennessee, 1948. 106 p.**

A plan for teaching related mathematics intended specifically for trade extension training of industrial workers in the metal trades. Specimen sheets illustrating certain principles which have been found effective in organizing material for trade extension classes are included.

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1480. GUNDERSON, B. HARRY. ***Mathematical Applications for the Machine Shop Trade Extracted from Trade Blueprints.*** **Ed.D., 1949, Indiana University. 181 p. Library, Indiana University, Bloomington.**

Purpose: To determine mathematics used by a machinist in working from blueprints. (This was limited to the mathematics required by the operative, apprentice journeymen and master machinists, as well as that used by tooling, designing and fabricating engineers in producing the prints from which machinists work.)

Source of Data: Author gathered 5,101 blueprints from 25 midwest machine shops ranking in size from 5 to 4,500 employees. A list was compiled of all the mathematical applications found on these blueprints. Lists were then submitted to the 25 cooperating establishments for rating on a three-point scale involving the necessary, desirable or unnecessary mathematics for the operative, apprentice, journeyman and master machinist.

Findings and Conclusions: This study has produced evidence that applications of mathematics have a place in machine shop training. It is also evident that the satisfactory placement of the mathematics is one of the chief problems in a training program. It is not enough for the worker to know the fundamentals of mathematics but the industrialists insist that these fundamentals be treated in their special machine shop applications. The 4 fundamental processes of arithmetic are necessary to machine shop mathematics but the special applications of these processes must be known before satisfactory emphasis for the training program can be ascertained. Implications for training in applications of mathematics are that the mathematics processes are a part of machine shop practice and not separate and divorced from it.

1481. HAROLD, HENRY D. (Masters). ***The Metal Trades Exploratory Facilities Present in the Junior High School Automobile Shop.*** **University of Southern California, 1930.**

1482. HARTJE, GEORGE FREDERICK. ***Devising a Teaching Experiment for Introducing Metal Cutting.*** **M. S., 1954, Purdue University. 47 p. Library, Purdue University, Lafayette, Indiana.**

***Purpose*:** To provide a metal cutting experiment wherein students could see the relative effects of cutting compounds and cutting tool angles and to show students how to improvise equipment for a study of cutting.

***Source of Data*:** An experiment in the Machine Tool Laboratory with three cutting compounds and three different rake angles was analyzed.

***Findings and Conclusions*:** Within limitations there is a best tool angle and a best cutting compound. The experiment, with the apparatus, makes a good visual aid in teaching, and affords the instructor and his students an opportunity to conduct some simple machineability tests.

1483. HAYES, LOUIS E. ***Major Advances in the Development of Welding.*** **M. S. in Ind. Ed., 1950, Kansas State Teachers College. 100 p. Porter Library, Kansas State Teachers College, Pittsburg.**

***Purpose*:** To trace briefly the major advances in the development of welding from approximately 1000 B. C. to the year 1950.

***Source of Data*:** Documentary approach with verification through correspondence with museum authorities, encyclopedia editorial staff, and manufacturers in the field of welding.

***Findings and Conclusions*:** China, Syria, Spain, and India are among the earliest to have made use of the welding process. Modern processes begin with the 19th century, where railroads and the Navy were among the first to use the process. Rapid improvements in the processes are being made. Oxy-acetylene, metallic arc, inert gas, atomic hydrogen and thermit are processes which apparently will find further improvement and expanded uses.

1484. HIEDEMANN, HANS H. ***Oxy-Acetylene Welding.*** **M. A., University of Minnesota, 1948. 206 p.**

The development of a course in fundamentals of welding for the commercial metalworker; objectives of the course, basic instructional units with suggested methods, and drawings of many of the jobs or exercises to aid visualization.

1485. HOCKEY, LAWSON E. (M. S.). *Course Content in General Metal for Industrial Arts.* Iowa State College, 1941. 82 p.

A study to determine on what grade level certain operations and information in general metal should be taught.

1486. INGMAN, DAVID K. (M. S.). *Copper Smelting as Practiced at Douglas, Arizona.* Colorado Agricultural & Mechanical College 1931. 74 p.

A review of the art of copper smelting as practiced in Douglas, Arizona. The most valuable type of educational background is discussed.

1487. JOHNSON MARTIN OLIVER. *Mathematical Units of Instruction for Machine Shop Lathe Work.* M. A., University of Minnesota, 1946. 102 p.

Units of instruction in machine shop mathematics to provide a more convenient means of teaching the items related to operation of the lathe.

1488. KEITH, MARLOW F. (Masters). *A Course of Study in Welding for Bisbee High School.* Arizona State College, 1946.

1489. KICKOK, DURLIN C. (Masters). *Junior High Boys' Interests in Metalwork as Revealed through Their Choice of Projects in the Metals Area.* Miami (Ohio) University 1940.

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1490. KLEIN, CHARLES T. (Ed. D.). *Course of Study in Related Science for Beginning Machine Shop Practice in National Defense Courses and Vocational Schools.* New York University School of Education, 1942. 347 p.

A course of study in science related to beginning machine shop practice. A course of study to be used in trade and industrial schools in New York State and in national defense machine shop courses is suggested.

1491. KNOSS, FORREST FRED (M. S.). *Machine Shop Operations in Industrial Arts Taught in High Schools in Minnesota.* Iowa State College, 1948. 41 p.

A survey of thirty-four high schools in Minnesota in which industrial arts machine shop courses were offered to discover the type and number of operations being taught.

1492. KOB, HOWARD H. *A Study of General Metal Shops.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 67 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To help develop a general shop plan which will contain all of the more desirable features indicated by the results of a questionnaire.

Source of Data: The questionnaire was used in securing part of the data. Certain information was found in current literature. An attempt was made to answer the following questions: What types of work should be included in a general metalwork course? Should shops be planned for both boys and girls? Should general metalwork courses be standardized as to content? Should it be required and what equipment should be found in a general metalwork shop?

Findings and Conclusions: Only 1 of 3 junior high school pupils in the schools studied has the opportunity for including metalworking in his program. Many schools do not include metalworking due to lack of space and equipment. A large percentage of high schools permit girls to take general metal courses. It would be desirable to equalize to a greater extent the amount of time devoted to courses in general metalwork in the lower grades.

1493. KRUMM, RICHARD DALE. *Casting Aluminum Around Steel.* M. A., 1950, Ohio State University. 81 p. Education Library, Ohio State University, Columbus.

Purpose: To analyze the problems involved in placing a piece of steel in the form of a screwdriver blade in a mold and pouring an aluminum handle around it.

Source of Data: Extensive experimentation in determining probable defects.

Findings and Conclusions: Holes enclosed within the aluminum were eliminated by several combined methods. Ideal molding procedures aid in the elimination of the defect but best results were evident when the steel is cleaned and dipped in the molten aluminum which not only heats the steel but gives it a thin coating; special methods were required to properly place and hold the steel. Through experimentation, estimation was found to be the best method to locate the bit when a few molds needed pouring. A special pattern design was found to have advantages over the estimation method when several molds were to be poured. Interest, exploratory and design possibilities were adequate to permit consideration of this process as a part of the industrial arts program. Size and contour of the experimental screw driver project permitted student initiative to be utilized in the design. It offered further opportunity to investigate at least five different industrial processes. Interest by students participating in the experimentation seemed genuine and enthusiastic as was evidenced by their desire to accomplish more than one screwdriver.

1494. KRUSE, EDWARD C. ***The Use of Thin Wall Molds in a Small Foundry.*** **M. Ed., 1951, Agricultural and Mechanical College of Texas. 82 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.**

Purpose: To ascertain the feasibility and use of thin wall molds in a small foundry, and to list sources of information that might be of assistance in the development of a program for a small foundry.

Source of Data: Data were secured from books, periodicals, encyclopedias, and bulletins.

Findings and Conclusions: The conventional foundry process uses large quantities of sand and no plastics, whereas the croning process makes a thin porous foundry mold out of a heat-setting plastic resin and a little foundry sand. This new process has been found to combine the advantages of increased production, reduced cost, improved quality of casting, and better health conditions.

1495. LANE, DONALD F. (M. S.). ***A Job Analysis of the Machinist Trade at the Sparrows Point Plant of the Bethlehem Steel Company.*** **Pennsylvania State College, 1942. 167 p.**

An analysis of the machinist trade involving all the tools and machines in the trade. Related information necessary to perform the operations and the time required to learn the operations are discussed.

1496. LUEHRING, ARTHUR H. (M. A.). ***General Metal Work for the Junior High School.*** **Indiana State Teachers College, 1934. 224 p.**

A study, based on an analysis of texts and questionnaires sent to teachers of metal work, to determine the content of a general metal course as a part of an industrial arts general shop, and to assist teachers in establishing and organizing courses of this type.

1497. LYNN, JOHN M. (M. A.) ***A Content Study of Aluminum for Industrial Arts Classes.*** **Ohio State University, 1936. 134 p.**

A study which includes the production, alloying, manufacturing, finishing, and uses of aluminum for the purpose of providing a source of information adaptable to industrial arts programs.

1498. MARTIN, ANTHONY J. ***Oxy-Acetylene Welding as Content Study for Industrial Arts.*** **M. A., 1949, Ohio State University. 97 p. Education Library, Ohio State University, Columbus.**

Purpose: To organize information pertinent to the average consumer and worker in this medium and to adapt it for school use.

Source of Data: The problem was attacked by making a critical study of the available literature. Information concerning methods of producing the gases, precautions to be observed in handling and using these gases, were organized. Welding techniques of welding common ferrous and non-ferrous metals were studied and instructional materials prepared.

Findings and Conclusions: That the modern oxy-acetylene blowpipe developed from a crude device used by alchemists; when using this process it is imperative that safety precautions be meticulously followed; that the Interstate Commerce Commission has developed regulations concerning methods of handling and storing gas containers, and that instructional materials suitable for use with high school students have been developed.

1499. MAYBERRY, WILLIAM C. (M. S.). ***An Art Metal Course for Industrial Arts Featuring the Use of Aluminum.*** **University of Tennessee, 1936. 115 p.**

A study of aluminum in relation to other metals in art craft work and how this work fulfills the general aspects of industrial arts. The study includes course content and how it was determined, instruction sheets for shop classes, and a discussion of tools, materials, and costs.

1500. McELHENY, JOHN RICHARD (M. S.). ***The Development of a Course of Study in Related Science for Machine Shop in East Chicago, Indiana.*** **Purdue University, 1942. 62 p.**

An analysis of questionnaires sent to tradesmen to determine the basic concepts of science which are related to machine shop. The ten concepts considered essential to the machinist were included in a course of study in related science.

1501. McGREGOR, WELLS P. ***Physical and Metallographical Properties of Welded Cast Iron.*** **M. S., 1950, Oklahoma Agricultural and Mechanical College. 44 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To ascertain which of several methods is best for welding cast iron.

Source of Data: This study was experimental, including testing of the original beams, preparing them for welding, actual welding, testing of the welded beams, cutting and preparing specimens for metallographic study, taking photomicrographs, and hardness testing.

Findings and Conclusions: The highest flexual strength obtained was in the set of gas fusion welds. The average of the set was 80.25 per cent of the value of the beams as originally cast. The average of the other 3 sets were bronze weld 75.65 per cent, preheated arc weld 71.5 per cent, and non-preheated arc weld 69.6 per cent. From the metallographic study, it was found that a grain coarsening occurred near the deposited or weld metal. The beams fractured at this point, the heat affected zone. The hardness tests showed that the weld and the heat affected zone had the greatest hardness, except the bronze weld, and the parent metal was softer.

1502. MILLER, HARVEY W. (M. A.). ***A Study of Tin as Content For Industrial Arts.*** **Ohio State University, 1936. 102 p.**

An historical study of tin from 1500 B. C. to 1936. Emphasis is on the refining processes, the latest alloys, and the modern usages of tin. The study considers the sources, production, distribution, and consumption, as well as the properties and industrial uses of this metal.

1503. MILNES, HAROLD C. (M. S.). ***Analysis of Related Information on Metals for Students of Industrial Arts and Industrial Education.*** **Iowa State College, 1936. 89 p.**

A study to determine which topics pertaining to metals, in the judgment of experienced teachers of metal work, should be included in industrial arts and vocational education courses.

1504. MOORE, JOSEPH H. ***A Course in General Industrial Metal Trades.*** **M. S., 1950, The University of Tennessee. 104 p. Library, University of Tennessee, Knoxville.**

Purpose: To present a plan which affords any town or community with opportunities for employment in varied metal trades, to provide a training program to meet its needs.

Source of Data: A comparison was made of 7 schools in the State of Tennessee that offer classes in general industrial metal trades during the school year 1949 and 1950.

Findings and Conclusions: A proposed floor plan for a general metal shop including the amount of equipment and the shop and stock room size. A proposed group of assignment and information sheets were compiled on: General mathematics, hand tools, machine shop, gas welding, arc welding, forge work, and sheet metal. Any town or community with opportunities for employment in varied metal trades may provide a training program to meet its needs under such a plan as has been presented.

1505. NELSON, ROBERT ROY. ***The Lost Wax Process of Precision Casting in Commercial Foundries.*** **M. S. 1948, Kansas State College. 26 p. Library, Kansas State College, Manhattan.**

Purpose: To examine the lost wax method of precision casting with the view of ascertaining its suitability for use in industrial arts.

Source of Data: Data were obtained from a review of available literature.

Findings and Conclusions: This process should not be used for industrial arts projects at this time, because of its complexity, the special materials needed, and the limited amount of low cost equipment available.

1506. ODLIN, FRANCES (Masters). ***Organization of a Course in Related Trade Science for Eleventh Year Toolmakers in a Co-operative School.*** **Wittenberg College, 1933.**

1507. OLSON, OSCAR H. (Masters). ***Constructing a Course in Related Science for the Machine Trade.*** **University of Wisconsin, 1930.**

1508. OYLEAR, CLARENCE (M. S.). ***A Course of Study for Elementary Oxy-Acetylene Welding.*** **Oregon State College, 1942. 160 p.**

The preparation of a course of study based on trade analysis, controlled experiments in teaching, tabulations of survey questionnaires, and an analysis of the literature in this field.

A program of study on visual teaching aids and charts and tables are included.

1509. PANCOST, MAURICE H. (M. S.). *Chemical Information for Beginning Workers in Metal Working Plants at Lansing, Michigan.* Colorado Agricultural & Mechanical College, 1938. 64 p.

A one-semester course in related chemistry. Functional rather than abstract treatment is stressed.

1510. PAULSON, PAUL MALONE. *Some Interesting Projects in Foundry.* M. Ed., 1953, Central Washington College of Education. 56 p. Library, Central Washington College of Education, Ellensburg.

Purpose: To acquaint industrial arts teachers with some of the projects and practices of foundry work as a possible part of their industrial arts program.

Source of Data: Data were secured from books, interviews and personal experience.

Findings and Conclusions: More attention should be given to foundry work in industrial arts as the work is basic to industry and youth are interested in it.

1511. PAWELEK, ALAN R. (M. A.). *Junior High School Sheet Metal.* University of Minnesota, 1938. 94 p.

A comparative study of the units to be presented in junior high school sheet metal courses. It includes the ranking of 125 units as to importance, order of presentation, difficulty, and required drill.

1512. PRICE, JOHN A. *An Explanatory Evaluation of the Lost Wax Process for Industrial Arts Teachers.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 91 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To present an explanation and basic working knowledge of the lost wax process in order to fit it into the existing activities of the industrial arts.

Source of Data: A description of the processes of casting using wax patterns.

Findings and Conclusions: Suggestions are offered to show how the lost wax process may be used in general shop, the art metal shop and evening classes for adults. The appendix contains many illustrations of its use.

1513. RICCELLI, JOHN J. (M. S.). *A Proposed Resource Unit for Oxy-Acetylene Welding in the Senior High School Industrial Arts Program for the State of Wisconsin.* The Stout Institute, 1947. 60 p.

Determines the necessary information to be included in a resource unit for oxy-acetylene welding. The major steps in the preparation of a resource unit and a sample resource unit in oxy-acetylene welding are included.

1514. SANBORN, LYLE DARRELL. *Metal Spinning Adapted to the School Shop.* M. S., 1951, Kansas State College. 53 p. Library, Kansas State College, Manhattan.

Purpose: To ascertain the adaptability of metal spinning to the school industrial arts shop.

Source of Data: Data were obtained from a review of available literature and experimentation.

Findings and Conclusions: The active instructor who is seeking a new and educational activity for his shop may find the answer in metal spinning.

1515. SHEPLEY, JOHN H. *Education for the Foundry Industry.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 103 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To meet the tentative needs of the foundry industry, through the training of students.

Source of Data: Library technique and documentary evidence through correspondence.

Findings and Conclusions: Junior and senior high school industrial arts should include work in foundry practice and consult the foundry industry as to type of training offered. Foundry work is one of the 5 largest industries. The industry is limited in its production due to lack of skilled workers. Vocational high schools are training students for either semi-skilled workers or as apprentices.

1516. SHUBAT, CHARLES A. *Oxy-Acetylene and Electric Arc Welding.* M. A., University of Minnesota, 1947. 108 p.

A course of study in welding for the senior high school with instructional aids for the several units.

1517. SMITH, REH LEE. *The Machine Shop in the Engineering Curriculum.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 101 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To investigate the need of shopwork in engineering curriculums and to prepare a course of study in machine shop practice.

Source of Data: Data were obtained from engineering schools and from articles and papers available.

Findings and Conclusions: Machine shop practice has been expanded in the last five years in many engineering curriculums, due to the availability of war surplus equipment and the growing recognition of need of presenting manufacturing processes.

1518. TOBIAS, JOHN BRADUTU A. *Bronze: Its Development and Characteristics With Interpretations for Industrial Arts.* M. A., 1949, Ohio State University. 91 p. Education Library, Ohio State University, Columbus.

Purpose: To show how bronze through its development has contributed to man's advance and how its particular characteristics have resulted in its manifold uses in modern industrial technology.

Source of Data: A review of the literature and a study of materials provided by manufacturers and by correspondence with men in industry producing bronze products.

Findings and Conclusions: A study of bronze will show the uses and development of a material that has made a significant contribution to the advance of technology and civilization. Bronze is a material that can be easily adapted for use in industrial arts laboratories.

1519. TRYGG, OSCAR A. (M. S.). *Unit Instruction Sheets and a Course of Study Based Upon an Analysis of the Machinists' Trade.* Oregon State College, 1932. 54 p.

A course of study for machine shop work in a technical high school.

1520. TURNQUIST, CARL H. (M. S.). *Outline of an Instructional Program for Gas and Arc Welding Students on the Secondary School Level.* Wayne University, 1946. 164 p.

An instructional program for secondary school gas and arc welding classes. The thesis is divided into three major sections: student management, lesson sheets, and job procedure sheets.

1521. UNDERHILL, HAROLD W. (M. A.). *A Source Unit of Metalworking Tool Processes for a Junior High Physical Environment Course.* Colorado Agricultural & Mechanical College, 1940. 60 p.

Curriculum changes that should be made to establish a physical environment course in a junior high school. A course of study in metals is outlined as an example. Bibliographies on metals, tools, and textbooks are included.

1522. VAN EMAN, ROBERT F. (M. S.). *Content of a Course in General Metal Work For High Schools.* Iowa State College, 1937. 77 p.

A study of the content of a course in general metalwork for use in high schools. A course outline and a suggested list of projects is included.

1523. VAN EYNDE, FRANK A. (M. S.), *A Vocational School Course in Mathematics Related to the Metal Trades.* University of Tennessee, 1937. 103 p.

A history of industrial education from 1917 to 1937 including an analysis of the metal trades for determining related mathematical content. It contains mathematical problems related to the metal trades and methods of using this material.

1524. WALDECK, PHILIP S. (Masters), *Content of Junior High School General Metal Work.* Ohio State University, 1932.

1525. WILLIAMSON, RUSSELL W., *Trigonometry for Machinists.* M. A., University of Minnesota, 1948. 126 p.

A teacher reference book to serve the absent pupil upon his return to the class in machine shop. Teaching of applied trigonometry as a related element in machine shop. Development of a sequency of progressive teaching pictures or visual aids.

1526. WILLINGS, BILLY J. *Appropriate Sheet Metal Projects for a Unit Course in Industrial Arts Sheet Metal.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 62 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To evaluate certain suggested projects in terms of the objectives of industrial arts and general education. To ascertain whether the projects can be constructed without first going through a practice session using tin cans.

Source of Data: Literature concerning the objectives of industrial arts and general education was reviewed; sheet metal work was studied and projects were selected which were considered appropriate. These projects were evaluated by experts to ascertain their suitability.

Findings and Conclusions: Well designed projects are of great importance in sheet metal practice. The projects selected were considered justifiable in terms of the aims of industrial arts. The projects selected can be constructed without first going through a practice session on tin cans.

1527. WILSON, PAUL L. (M. A.), *Science Involved in the Teaching of General Metal.* Colorado State College of Education, 1940. 120 p.

A study determining the science principles involved in the teaching of general metal in industrial arts courses.

1528. WRIGHT, RAPHAEL G. *A Few Metal Finishes Not Now in General Use Adaptable To the Small Shop.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 112 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the metal finishing processes now in use in the small shop, to discover additional metal finishing processes that might be used, and to prepare instructional materials on these metal finishing processes.

Source of Data: Data were obtained from books, letters, and bulletins.

Findings and Conclusions: There are many finishes suitable for use in the small shop which are not now being used. A definite need exists for more general dissemination of knowledge in this area.

1529. ZUPANCIC, JOSEPH E. *Student Interest in High School General Metalwork.* M. Ed., 1955, The Ohio State University. 58 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain why tenth grade students at East High School, Columbus, Ohio, do or do not enroll in the metalworking course.

Source of Data: Data were obtained from two questionnaires, one for shop students and the other to non-shop students.

Findings and Conclusions: Students wanted more laboratory and theory time and more credit for the course. The majority wanted the course designed to develop hobby interests and expressed a desire to learn operations and skills associated with home repairs.

Miscellaneous

1530. ALLEN, ORVILLE E. (Masters). *A Study of Abrasives with Implications for Industrial Arts.* Ohio State University, 1939.

1531. AMAN, CELESTINE HOMER. *An Industrial Arts Transportation Program for the Secondary School.* M. A., 1951, The Ohio State University. 106 p. Library, The Ohio State University, Columbus.

Purpose: To derive a workable and feasible method of presentation of the field of transportation within the framework of an industrial arts program, and the goals of general education.

Source of Data: Data were obtained from the Transportation Laboratory at the Abraham Lincoln Junior-Senior High School, Philadelphia, Pennsylvania.

Findings and Conclusions: A unit transportation laboratory is entirely possible and adaptable to the general education curriculum at the secondary level. Unless care is maintained, the course content may become narrow in scope or specialized in one or two limited areas of the entire field. The instructional content should be segregated into units of instruction and the activities of the program are best organized around processes and procedures, rather than projects.

1532. ANDERSON, ARTHUR DAVIS. *Industrial Design and Industrial Arts.* M. Ed., 1954, Wayne University. 15 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To relate the methods of industrial design to industrial arts.

Source of Data: Data were obtained from observations and articles.

Findings and Conclusions: Many of the outcomes of activities carried on in industrial arts have been less meaningful to the student, because he has only been allowed to follow a procedure sheet to construct a teacher-designed project as an end for his efforts. A student designed project can include the steps of industrial design, which means complete planning from the recognition of the need for, to the evaluation of, the finished project.

1533. **ANDERSON, PHILIP R.** (M. A.). *Coated Abrasives, Their Nature and Use in the Laboratory of Industry.* The Ohio State University, 1940. 102 p.

An historical approach to the development and use of coated abrasives in industry and their application to the field of industrial arts education.

1534. **BAMBRICK, E. J.** (M. S.). *A Program of Stage Craft for Peoria Central High School, Peoria, Illinois.* Colorado Agricultural & Mechanical College, 1941. 86 p.

A plan of stagecraft production to facilitate staging promptly and effectively. The report includes a production timetable as it affects actors, scenery, properties, lights, and sound.

1535. **BARISAS, BERNARD G.** *Basic Controlling Factors Involved in Conducting Industrial Arts Work-Type Contests.* M. S., 1951, Stout State College. 95 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the basic controlling factors involved in conducting an industrial arts work-type contest.

Source of Data: Data were obtained from a review of literature on contests, and psychological and sociological aspects of competition and cooperation. A check-list was sent to three contest areas.

Findings and Conclusions: Six basic areas of control, together with contest objectives were proposed in form of a check-list. The unit included the following area: Objectives, project selection, classification of entries, judging, awards, publicity, and evaluation. By agreement as to the importance of some factors, it is evident that a check-list might provide the sponsors with a medium for determining where needed improvements could be made.

1536. **BENGTSON, LEROY H.** *Dry-Kiln Proposal for Oklahoma Agricultural and Mechanical College.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 101 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To determine the advisability of constructing and operating a modern dry-kiln by the college to be used for instructional purposes and for research, and investigate the use of Oklahoma produced lumber.

Source of Data: A study was made of other college-operated dry-kilns. A 2-weeks' course was taken at the Forest Products Laboratory, Madison, Wisconsin. Plans were completed for the construction of the building and a proposed equipment list was prepared and approved by dry-kiln engineers.

Findings and Conclusions: This investigation showed that native lumber was cheaper to use. This installation could be used in the industrial arts and forestry departments for instructional purposes and for research. The building could be erected as a part of the present building where all utilities and controls are available.

1537. **BLEVINS, GRAIG MARION.** *Presenting Basic Descriptive Geometry Problems Pictorially.* M. S., 1955, Kansas State Teachers College. 74 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To show that a more direct and simpler approach is available through pictorial presentation for presenting descriptive geometry.

Source of Data: Data were obtained by analyzing fourteen descriptive geometry texts, developing a set of graphic fundamentals, and analyzing pictorial methods and comparing them with stereographic pairs.

Findings and conclusions: The illustrations, subject matter, and basic problems of mechanical drawing and descriptive geometry suggest that the courses might well be combined.

1538. **BUMP, EUGENE E.** *Integrated Mathematics in the Industrial Arts Program.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 115 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To investigate and list common mathematical problems in electricity, automobile mechanics, woodwork, graphic arts, and metal working.

Source of Data: Survey of industrial arts areas for mathematical problems, interviews with industrial arts teachers.

Findings and Conclusions: Basic mathematics needed in industrial arts, including arithmetic, algebra, geometry, and trigonometry, are grouped together with methods of presentation. There were no problems found concerning the areas studied that would indicate a study of mathematics beyond the level of trigonometry.

1539. COX, LUCIUS L., Jr. *A Study of the Endocrine Glands and Their Implications for Education, With Special Emphasis on Industrial Arts.* M. S., 1953, North Texas State College. 88 p. Library, North Texas State College, Denton.

Purpose: To review available information concerning the endocrine glands, their effect upon the individual, and his ability to participate in the program of education with special emphasis on industrial arts activities.

Source of Data: Data were secured from books, literature pertaining to endocrinology and from observations of students enrolled in industrial arts classes.

Findings and Conclusions: Many of the effects that the endocrine glands have upon an individual's ability to participate in a program of education may be identified through observation. A teacher of industrial arts should have a good understanding of the functions of the endocrine glands.

1540. DIVERS, LANGDON P. (Masters). *Boat Building Exploratory Unit in Junior High School Industrial Arts.* University of Wisconsin, 1933.

1541. HENDERSHOTT, CLEO HAMMETT (Masters). *A Study of the Native Texas Clays Relative to Their Value for Pottery Making in the Public Schools.* North Texas Teachers' College, 1940.

1542. JACKSON, ROY I. (Masters). *A Course of Study in Cleaning, Dyeing, Spotting, Pressing for Vocational Classes.* University of California, 1935.

1543. KAZYAK, BEN A. (M. A.). *Technique of Preparing and Presenting a Course in Practical Shop Trigonometry.* Wayne University, 1935. 54 p.

An analysis of typical problems from tool, dierooms, drafting, and engineering rooms to determine the selection and order of trigonometric principles to be taught in correlation with tool making and tool design courses.

1544. KOENIG, RAY L. (M. S.). *A Course in Upholstery.* Colorado Agricultural and Mechanical College, 1940. 71 p.

A course of study, including operation sheets to be used as a text, for teaching upholstery in the industrial arts shop and the trade shop.

1545. LAUGHLIN, ROBERT M. *Coated Abrasives.* M. A., 1951, University of Minnesota. 57 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To describe the characteristics, uses, storage, and selection of coated abrasives in use in the industrial arts shop.

Source of Data: Data were obtained by the documentary method.

Findings and Conclusions: The report contains useful information on coated abrasives used in metalworking and woodworking.

1546. MARSHALL, JAMES RILEY. *An Investigation of Decorative Laminates; Their Possibilities and Limitations in Industrial Education.* M. Ed., 1954, Agricultural and Mechanical College of Texas. 47 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the possibilities and limitations of decorative laminates in industrial education.

Source of Data: Data were secured from books, periodicals, brochures, and pamphlets.

Findings and Conclusions: These materials have limited use in industrial education.

1547. MEYERS, SHELDON S. *Application of High School Mathematics in Industrial Chemical Analysis.* M. Ed., University of Cincinnati, 1946. 109 p.

A study of the practical applications of high school mathematical processes in the industrial chemistry laboratory, including frequency, relative importance, number of applications, and significance for the mathematics and science teacher.

1548. NICHOLS, ROSS E. *A Course of Study for Furniture Upholstering.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 52 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a course of study in furniture upholstery on the high school or college level.

Source of Data: Library technique and documentary evidence through correspondence.

Findings and Conclusions: The art of upholstering has been retarded due to the lack of trained instructors and textbooks. The cost of necessary equipment for an upholstery shop is lower than for most shop courses now being taught. Three sample tests are submitted with a glossary of 58 related terms.

1549. PAUL, GERALD W. *Fundamental Construction in Descriptive Geometry.* M. A., University of Minnesota,, 1944. 98 p.

A graphic portrayal of constructions in descriptive geometry, with explanations for visual aid purposes in industrial teaching.

1550. PRICE, ESTHER COLLIER (Masters). *A Proposed Course of Practical Mathematics as Related to Trade Dressmaking Instruction.* Oklahoma A & M College, 1934.

1551. RANDELS, MALVERN WILLIAM (M. A.). *Amateur Stagecraft: A Content Study of the Design and Construction of Stage Scenery with Specific Reference to the Contributions to Education.* Ohio State University, 1940. 125 p.

A description of amateur stagecraft, in relation to industrial arts, as experienced at Lincoln High School in Canton, Ohio. The physical techniques required to stage an amateur theatrical production are related to the contacts with a variety of materials, processes, and occupations.

1552. SCOTT, O. ROWLAND (M. A.). *Industrial Chemistry in Modern Education.* Wayne University, 1937. 94 p.

An historical study of the role of industrial chemistry in education and a description of the course in industrial chemistry developed in the Henry Ford Trade School.

1553. SHIPE, WILLIAM W. *Fiberglass—A New Basic Industrial Material.* M. A., 1949, Ohio State University. 137 p. Education Library, Ohio State University, Columbus.

Purpose: To provide the information which would acquaint the consuming public with this new but basic industrial material and the thousands of end products.

Source of Data: Information was collected from books, pamphlets and interviews with plant personnel at the Newark plant of the Owens-Corning Fiberglass Corporation.

Findings and Conclusions: Fiberglass is seldom seen as a recognizable glass product since almost the entire production is used to make other products, such as: Electrical insulation, thermal and acoustical insulations, decorative fabrics, reinforcement for plastics, and in the field of medicine.

1554. SHULL, HOWARD I. *Clay-Resin Bonded Materials: Their Use in the Industrial Arts Laboratory.* M. A., 1948, Ohio State University. 61 p. Education Library, Ohio State University, Columbus.

Purpose: To set forth pertinent information about clay resin bonded materials, their comparison to other ceramic materials and their use in the industrial arts laboratory.

Source of Data: The Battelle Memorial Institute, Columbus, Ohio determined the physical, chemical, and mechanical characteristics of these materials by the use of standardized test procedures.

Findings and Conclusions: Ceramic materials form a significant part of, and make many contributions to society. Since these materials can now be cured with less expensive equipment than is required in the prior act, and since even greater possibilities in the decoration of the wares produced, their contribution is a decided improvement in the ceramic art.

1555. SMITH, JAMES ASBURY. *Boat Building in School Shops.* M. S., Oklahoma Agricultural and Mechanical College, 1942. 130 p.

A discussion of boat building as a phase of industrial arts.

1556. STEVENSON, JAMES E. (M. A.). *A Course of Study in Boat Building for Secondary Schools.* Stanford University, 1936. 106 p.

This description of boat building as an industrial arts subject treats the following topics: development and present types of boats, operation and construction of boats, equipment and supplies necessary to equip a small boat building shop, correlation of boat building with other subject fields.

1557. WALD, ARTHUR B. (*Masters*). *Copper as Content for Industrial Arts.* Ohio State University, 1937.

1558. **WARREN, Jr., SHANNON ELVIN.** *Native Materials of South Florida—Their Role in Industrial Arts.* M. A. E., 1954, University of Florida. 200 p. College of Education, University of Florida, Gainesville.

Purpose: To promote interest in design, and creative expression in the use of native materials, especially those available in the southern part of Florida.

Source of Data: Data were secured from artisans expert in the use of native material.

Findings and Conclusions: The report contains suggestions for using native materials to enrich the industrial arts program of the area.

1559. **WILKEN, CLAUDIUS W.** *Ceramics—A Suggested Industrial Arts Course and Instructional Detail.* M. A., University of Minnesota, 1947. 137 p.

Organization of an industrial arts course in ceramics with detailed preparation of units of instruction.

1560. **WOODWARD, MORTIMER H.** *Technical Information on Modern Embalming.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 82 p.

A compilation of technical information for student morticians, based on trade publications, medical dictionaries, and interviews with funeral service workers.

1561. **ZEDIKER, HARRIET R.** (Masters). *The Preparation of a Course in Related English for the Tenth Grade in the Trade School.* University of Pittsburgh, 1933.

Photography

1562. **ANDERSON, CARROL FREDERICK.** *Photography Unit for a General Shop.* M. S. in Ind. Ed., Kansas State Teachers College, 1945. 32 p.

An outline, with instruction sheets, for photography in the general shop.

1563. **BARBE, H. D.** (M. A.). *Photography with Adaptations to Industrial Arts.* University of Minnesota, 1936.

1564. **BINSTOCK, EDWIN J.** *Photography in Secondary Schools.* M. S., 1951, Stout State College. 54 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain present practices in offering photography as a secondary school subject, the need for photography instructors, and the opportunities for industrial arts teachers qualified to teach photography.

Source of Data: Data were obtained by a questionnaire sent to seventy-six respondents in secondary schools. These were located in cities with a population ranging from 4,000 to 6,000 spread throughout the United States.

Findings and Conclusions: Photography, although not assigned full academic status, is important enough to receive recognition, especially through classes or clubs conducted by the science teachers, on the secondary level. Equipment for conducting the work is generally lacking.

1565. **COLLINS, BASIL KNIGHT** (Masters). *Photography as an Industrial Arts Activity.* Alabama Polytechnic Institute, 1940.

1566. **HARRIS, WOODFIN G., Jr.** *Photography as an Industrial Arts Activity.* M. S., 1954, Oklahoma Agricultural and Mechanical College. 57 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop units of instruction and experiments for a class in elementary photography.

Source of Data: Data were obtained from books, periodicals, pamphlets, and discussions with persons teaching photography.

Findings and Conclusions: An elementary course in photography may be used to a great advantage in the attainment of the objectives of industrial arts through the use of the many photographic devices and processes.

1567. **HELSBY, ROBERT DAVIS.** *Photography: A Study Concerning the Enrichment of Industrial Arts Through Its Use.* M. A., 1948, Ohio State University. 170 p. Education Library, Ohio State University, Columbus.

Purpose: To determine the contribution of photography to the industrial arts teacher and to the profession.

Source of Data: Experimentation with inexpensive equipment on an amateur basis.

Findings and Conclusions: The multiple uses of photography are evident in the field of industrial arts. Teacher education institutions should acquaint prospective teachers with the opportunities within the area through experiences in carefully designed courses. Photography has been proved a very useful tool in the industrial arts laboratories and if used properly will assist the teacher in attaining new teaching effectiveness, new personal satisfactions and new methods of advancing the status of a growing profession.

1568. JOHNSON, FRED HOLTON. ***Photographic Teaching Aids.*** **M. A., 1949, University of Minnesota. 82 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To add to the knowledge of camera and non-camera techniques of teaching.

Source of Data: Data were gleaned from references.

Findings and Conclusions: Instruction sheets for making photographic teaching aids were made.

1569. KEITH, DOUGLAS L. ***Photography in the High Schools of Northeastern California.*** **M. A., 1953, Chico State College. 57 p. Library, Chico State College, Chico, California.**

Purpose: To ascertain the status of photography in the secondary schools of Northeastern California, and to formulate suggestions for advancing photography.

Source of Data: Data were secured by questionnaire and personal visits to schools in the area.

Findings and Conclusions: Nine of the thirty-four schools offered photography and two were planning to add it. Material covered was very limited and frequently connected with science courses. There is a need for standards for evaluating methods and equipment as well as a more adequate definition of the purpose of photography instruction and its place in the high school curriculum.

1570. KIPP, WADE MASON. ***Photography in Industrial Arts; Resource Material Appropriate for the Secondary School.*** **M. A., 1950, University of Maryland. 75 p. Library, University of Maryland, College Park.**

Purpose: To present educational possibilities of photography at the secondary school level to analyze the relationship of instruction in photography to objectives of general education, and to develop a resource unit for the photography teacher.

Source of Data: A survey was made of secondary schools offering courses in photography. Names of the schools were obtained through the state departments of education. Manufacturers of photographic equipment were also contacted as a source of information.

Findings and Conclusions: The study presents a series of units in outline form to assist teachers who desire to offer instruction in photography. Helpful suggestions are also included for setting up a photographic laboratory in a school.

1571. MATZ, CLIFTON H. ***Photography As A Classroom Subject in Selected High Schools of Four States.*** **M. S., 1950, Iowa State College. 52 p. Library, Iowa State College, Ames.**

Purpose: To determine the extent and position of photography as it is offered in high schools.

Source of Data: Questionnaires were sent out to teachers of photography in high schools in cities of a population of 10,000 or greater in the States of California, Illinois, New York, and Texas.

Findings and Conclusions: The majority of the schools offer photography as a course titled "Photography" within the science department. Other departments in which courses in photography were offered are: Industrial education, photography, and art. The greatest number of the schools offered photography in the 11th and 12th grades. The teachers of these schools intimated it should be offered as an 11th grade subject. Credit is given in photography as photography in 31 of 81 schools studied. Seventeen of the schools listed the credit as a credit in science and 26 listed photography as a non-credit course. The mean class size of the schools studied were 24.45 students per class. The teachers of these schools recommended a mean class size of 15.84 students per class.

1572. McINTYRE, HAROLD J. (Masters). ***A Study of the Possibilities of Photography as a Unit in the Laboratory of Industries.*** **Ohio State University, 1931.**

1573. MEHALLIS, GEORGE. ***Development and Construction of Inexpensive Photographic Equipment in the Industrial Arts Laboratory.*** **M. A., 1948, Ohio State University. 101 p. Education Library, Ohio State University, Columbus.**

Purpose: To present information relative to developing and constructing inexpensive photographic equipment which may be used by high school pupils in industrial arts.

Source of Data: Examination of books and magazines for appropriate projects. A criterion was developed and used to select projects offering possibilities for stimulating interest and challenging student initiative.

Findings and Conclusions: All equipment developed was used repeatedly with satisfactory results; results produced attest that laboratory built equipment is feasible at a reasonable cost; student activity was stimulated and additional opportunities provided for students to achieve exploratory experiences.

1574. MESMER, OWEN J. *Recording Industrial Arts Projects on Color Transparencies.* M. Ed., 1947, Wayne University. 20 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To describe a way of using color transparencies for collecting designs for industrial arts projects.

Source of Data: Data were obtained from experiments in photography carried out by the author.

Findings and Conclusions: It is believed that the use of color transparencies will provide a good plan for collecting and having on hand a large assortment of suggested projects for industrial arts.

1575. MILLER, ELDRIDGE A. (Masters). *A Course of Study in Photography for Industrial Arts Pupils in High Schools.* Iowa State College, 1935.

1576. MOYER, PAUL MERLE (M. A.). *Motion Picture Photography.* Ohio State University, 1939. 150 p.

A study of cinematography for industrial arts education. It includes an historical study of optics with emphasis on the motion picture machines now available, their operation, and their future implications.

1577. PORTER, HOWARD RUSSELL (M. A.). *Photography: A Semi-professional Course for the Junior College.* Stanford University, 1932. 106 p.

An analysis of the professional photographers' trade. The study discusses work opportunities for photographers in industry, evaluates school programs in photography, and offers recommendations.

1578. POWELL, SHERWIN D. *Photographic Illustrations in a Self-Teaching Booklet for Leathercraft.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 42 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To develop a series of photographs which can be used by an individual to teach himself the basic steps of leather tooling and leather carving.

Source of Data: The camera was placed behind the worker in order to get the "operator view." Each picture stresses only one operation.

Findings and Conclusions: The series of 30 photographs is arranged in a sequence designed to illustrate the basic tool processes of leather tooling and leather carving. Essential information regarding preparation of the leather is contained in the paper.

1579. PUSTI, NICHOLAS. *Photography: A Study of the Camera and Its Uses, With Implications for Industrial Arts.* M. A., 1955, The Ohio State University. 93 p. Library, The Ohio State University, Columbus.

Purpose: To sketch the historical development of the camera and to ascertain some of the implications of photography in an industrial arts program.

Source of Data: Data were obtained from manufacturers of photographic equipment, from published material on the development of the camera and its supplies, and by personal interviews.

Findings and Conclusions: Photography as an area in industrial arts has many possibilities for the enrichment of the program through the medium of a photography club, the development of hobby and recreational interests, and consumer education.

1580. SAUNDERS, ALDEN C. (Masters). *A Course in Photography Designed for Junior High School Pupils.* Rhode Island College of Education, 1941.

1581. TAYLOR, MELVIN B. *A Photomicrographic Technique for Producing Art Source Material From Microscopic Substances.* M. S. in Ind. Ed., 1949, Kansas State Teachers College. 128 p. Porter Library,

Kansas State Teachers College, Pittsburg.

Purpose: **To indicate the use of microscopic materials as art motifs; to formulate photomicrographic data and techniques in producing photomicrographs; to produce color slides, black and white positives, and photographic paper prints as source material for use in the art classroom.**

Source of Data: **Designed a slide copy apparatus which made it possible to use the Rayoscope in the production of photomicrographs. With this equipment a series of color slides, black and whites, and enlargements were produced.**

Findings and Conclusions: **The slide copy apparatus, in conjunction with the Rayoscope, may eliminate the usual expensive photomicrographic equipment in the making of photomicrographs in color and black and white. The technique may be applied to any area desiring such visual materials.**

1582. VALLIERE, WESLEY E. ***The Photomicrography of Non-Crystalline Substances for Art Source Material.*** **M. S. in Ind. Ed., 1950, Kansas State Teachers College. 92 p. Porter Library, Kansas State Teachers College, Pittsburg.**

Purpose: **To produce photomicrographs of noncrystalline substances for use as art motifs.**

Source of Data: **Inexpensive equipment was designed and used in making photos from materials on microscopic slides. The enlarged photos were submitted to art students for source material.**

Findings and Conclusions: **Unlimited materials are available for conversion into microscopic slides. Exposure meters are highly desirable in obtaining correct exposures. Art students found the photos to be a genuine source for new "idea material." The study contains black and white and color slides, photos of the microscopic materials, and photos of the plates done by art students working from "source material."**

1583. WATKINS, JOHN EDMUND. ***The Development of Photography in the High Schools of Oklahoma.*** **M. S., 1955, Oklahoma Agricultural and Mechanical College. 133 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: **To ascertain the status of photography classes in the Oklahoma high schools.**

Source of Data: **Data were collected through the use of questionnaires and by personal visits to the schools.**

Findings and Conclusions: **The number of photography classes in Oklahoma high schools has increased steadily since the first such course offered for credit in 1945. Lack of qualified teachers, equipment, and space are major problems.**

1584. WERTZ, CLIFFORD R. (Masters). ***Development and Use of Photography in the Industrial Arts Laboratory.*** **Ohio State University, 1940.**

Plastics

1585. BRIDGES, WALLACE C. ***A Survey of Plastics and Their Use in the Handicrafts.*** **M. Ed., 1950, Agricultural and Mechanical College, of Texas. 30 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.**

Purpose: **To ascertain the uses which can be made of plastics in the high school industrial arts program.**

Source of Data: **The area of handicrafts was studied with the aim of discovering means of utilizing plastics. Different types of plastics were analyzed to ascertain which ones were most applicable for school use and these were tested by using the various types in the construction of projects.**

Findings and Conclusions: **The thermoplastic type plastics deemed most applicable to handicraft work. The acrylic type, Lucite and Plexiglas most frequently used in handicraft. The use of plastics, in craft projects is limited only by the ingenuity of the instructor and students.**

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1586. CANTOR, ROBERT LLOYD. ***A Study of the Industry and Field of Plastics as a Creative Medium for Avocational and Vocational Uses of the Layman.*** **Ph. D., 1952, New York University. 260 p. Library, New York University, New York.***

Purpose: **To study the field of plastics in the light of utilization of industrial methods, materials, processes, and equipment by the layman with emphasis on classifying, clarifying, and synthesizing the available technical and engineering source materials; to provide creative, vocational, and avocational outlets for the layman with specially created plastics molding equipment, and to devise new methods**

for plastic utilization in today's schools which would be more rewarding and representative of this field of industry.

Source of Data: Data were secured through extensive consultation of technical literature and visits to one hundred-fifty industrial plants. These data were utilized in devising minimal equipment and verified by seventeen industrial experts. The equipment thus designed was actually produced.

Findings and Conclusions: Plastics minimal equipment could be used to keep down small lot production costs, for pilot runs, sounding out the market, experimental and development work, industrial design studios, vocational orientation courses for counseling purposes, short trade and terminal courses, elementary and secondary schools, college courses, occupational therapy, testing instruments, new avenues for artists and architects, industrial sales, visual aids, demonstration of plastic materials, hobbies, and adult education. It further provides for simpler processing demanded by the plastics industry, development of consumer literacy, and avenues for self-realization, development of skills, and appreciation of industrial products.

1587. COLLINS, CHRISTIAN T. (M. S.). *Plastics as an Industrial Arts Subject.* Oklahoma A & M College, 1941. 96 p.

A general survey of plastics from 1931 to 1941 indicating the trends they appear to be following in the industrial arts program.

1588. COOPER, CHARLES A. *Plastics Working As a Subject in Secondary School Industrial Arts Program.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 97 p.

A history of the development of the plastics industry, an attempt to justify plastics working as an industrial arts subject, a discussion of equipment requirements and a proposed course of study.

1589. EDGAR, HAROLD F. *Plastics in the High School Industrial Arts Curriculum.* M. S., 1950, The Stout Institute. 98 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To provide the background for a broader study of plastics in the industrial arts department in which the writer teaches. The specific purpose was to discover how industry makes use of plastic materials and to relate those uses to the various areas of industrial arts education.

Source of Data: A survey of trade magazines, technical books, advertising literature, magazines, and newspapers, was made to determine the industrial uses of plastic materials. From a survey of State bulletins, the areas of industrial arts to be used in the study were determined. These and other literature written concerning plastics were also surveyed.

Findings and Conclusions: It was found that plastics were used in each of the areas of industrial arts used in the study. The techniques for working plastics were similar to those for working metal and wood. Recommendations were: Units concerning the use of plastic materials be integrated with the instructional material in each of the industrial arts areas; techniques which are used industrially in utilizing plastic materials be related to the area in which similar techniques are used; information concerning consumer products utilizing plastic materials be included in the instructional material in the areas of industrial arts; instructors of industrial arts become better informed concerning plastics; a summarized report of the study be sent to interested companies; the study be used as background material for additional studies relating plastics to each of the industrial arts areas through instructional units; and studies to develop the instructional material for consumer education, units of instruction for each of the primary areas of industrial arts, the use of plastics as a safety factor in industrial arts shop, and the special techniques for using plastic materials in the shop program.

1590. FREDRICKSON, WADE O. *A Study of the Different Types of Plastics to Ascertain Their Suitability as a Material in the Construction of Projects in Industrial Arts Programs.* M. S., 1954, North Texas State College. 88 p. Library, North Texas State College, Denton.

Purpose: To analyze the different types of plastics to ascertain their suitability as a material for industrial arts classes.

Source of Data: Data were obtained from plastic manufacturers and suppliers and laboratory tests and experience.

Findings and Conclusions: Plexiglass and Lucite are very suitable for most industrial arts projects. Cellulose acetate, and cellulose acetate butyrate are suitable within certain limitations. Vinylite plastics are very suitable but are not readily available and are more expensive than the acrylic plastics.

1591. HOLLISTER, ROBERT D. *The Development of Plastic Mock-ups for Use in an Automotives Laboratory.* M. A., 1949, Ohio State University.

105 p. Education Library, Ohio State University, Columbus.

Purpose: To construct transparent plastic mock-ups in the industrial arts laboratory for the teaching of automotives.

Source of Data: Personal experience as an army instructor in using mock-ups during war. Literature on working with plastics (plexiglas).

Findings and Conclusions: How plastic mock-ups may be used in automotives. The basic principles in working with plastics. How to construct special sets for demonstration purposes. Samples for using the mock-ups for demonstration in the teaching procedure.

1592. HOLLOWAY, GEORGE N. *Plastics in Industrial Arts.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 57 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To justify the inclusion of plastics as an industrial arts subject.

Source of Data: Data were obtained from magazine articles and books.

Findings and Conclusions: In recent years plastics have been used quite extensively as indicated by articles in stores and homes. If boys and girls are to have a more complete education, it is necessary to have an understanding of the many plastics articles in the home, school, and community.

1593. HOPKINSON, HILDA M. (Masters). *Vocational Training in Plastics for Prevocational Classes.* Boston University, 1944.

1594. JAMES, A. S. Jr. *The Development and Use of Plastics in Industry with Proposals for the Adaptation of Plastics as a Phase of Industrial Arts.* M. S., 1951, North Texas State College. 101 p. Library, North Texas State College, Denton.

Purpose: To ascertain the need for including plastics as one phase of work in industrial arts.

Source of Data: Data were obtained from periodicals, books, and pamphlets pertaining to the plastics industry.

Findings and Conclusions: There is a need for consumer education to acquaint the buying public with the advantages and limitations of plastics. Plastics may be used in several courses in industrial arts but are particularly well suited as a handicrafts material.

1595. NICHMANN, HAROLD H. (M. A.). *Plastics in Industrial Arts Education.* Southwest Texas State Teachers College, 1947. 57 p.

A survey of the plastics industry and notations relative to use of certain plastics in schools situations. Included are discussions on the growth of the plastics industry, descriptions of certain plastics, types of plastics used in schools, and the nature of organized courses in plastics by states.

1596. SCHRODERMEIER, V. G. *The Development of Wood Plastics.* M. Ed., Colorado Agricultural and Mechanical College, 1945. 64 p.

A complete history of the development of plastics and how it has affected our lives in recent years. World War II was the proving ground for many of the plastics that are being used today.

1597. SEALY, EMMA L. *Plastics, Their History and Use.* M. S., North Texas State College, 1946. 51 p.

An account of the development and use of plastics in America.

1598. SHILTS, EDWARD FRANCIS. *A Unit of Plastics For the General Shop.* M. S. in Ind. Ed., Kansas State Teachers College, 1947. 91 p.

Drawings, data, and instruction sheets suitable for a general shop unit in plastics are supplied.

1599. TEMPLIN, HOMER M. (M. Ed). *The Place of Cast Phenolic Resin Plastics as a Medium in Industrial Arts.* Colorado Agricultural & Mechanical College, 1947. 98 p.

An historical account of the development of plastics. Operation and information sheets point out applications in the school shop.

1600. TESCHKE, THEODORE F. *A Proposed Resource Unit in Plastics for Wisconsin Schools.* M. S., 1949, The Stout Institute. 122 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To determine what information should be included in a resource unit for plastics.

Source of Data: The literature in the field of resource units was studied to determine an outline, its divisions, and its contents.

Findings and Conclusions: From this material a sample resource unit was developed which includes the more significant items from the study. These are combined into a proposed resource unit for plastics and presented to the Statewide Industrial Arts Committee of the Wisconsin Cooperative Planning Program for evaluation and use. The proposed resource unit in plastics includes: Introduction, significance of the topic, brief outline of the topic, possible outcomes, inventory of possible activities, definitions, classifications, types, methods of working, operation instructional sheets, technical information sheets, general information sheets, guidance information sheets, evaluation, reference materials, and a list of films on plastics.

1601. WOODARD, CLAUDE LOWELL. *Plastics in the General Shop.* M. S., 1949, Kansas State College. 35 p. Library, Kansas State College, Manhattan.

Purpose: To investigate the acrylic resins; to ascertain methods and techniques of fabrication which are suited to the equipment found in the average school shop.

Source of Data: Data were obtained from a review of available literature and experimentation.

Findings and Conclusions: Acrylic resins may be fabricated into simple projects by the use of woodworking tools.

1602. WOODFIN, WILLIAM RUSSELL. *A Proposed Program Of Study With Instruction Sheets for an Industrial Arts Course In Plastics.* M. S., 1954, University of Tennessee. 111 p. Library, University of Tennessee, Knoxville.

Purpose: To develop a course of study with instruction sheets for an industrial arts plastics course.

Source of Data: Data were obtained from library sources.

Findings and Conclusions: A course of study is outlined presenting fundamental operation, related information, and plastics design. Instructions are given in the form of job sheets.

1603. ZSENYUK, ALEX. *Adapting A Wood Shop for a Plastic Activity.* M. Ed., 1954, Wayne University. 43 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To evaluate the possibility of adapting a wood shop for a plastics activity in the Detroit public schools.

Source of Data: Data were obtained by questionnaires sent to and personal visits with prominent plastics authorities, teachers experienced in working with and teaching plastics, and the general woodworking teachers of the Detroit Intermediate Schools.

Findings and Conclusions: Adapting a wood shop for a plastics activity in the Detroit Public Schools is practical and its introduction in the woodshop is justified.

Woodwork

1604. ANDERSON, WADE MAPLES. *Facilities and Techniques for the Finishing of Industrial Arts Projects.* M. S., 1954, Oregon State College. 103 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain methods, materials and equipment used in the finishing of projects in woodworking classes of the public secondary schools of Oregon.

Source of Data: Data were secured by questionnaires sent to selected instructors in Oregon schools.

Findings and Conclusions: Major difficulties found in the finishing of industrial arts projects were caused by dust from the machines, insufficient and improper finishing equipment, inadequate space, and poor drying facilities. Many instructors have failed to use the more modern synthetic finishes, largely because of lack of spraying equipment.

1605. ARBOGAST, DEAN ORIS. *Allowable Grade Levels For Operating Woodworking Machinery.* M. S., 1952, Illinois State Normal University. 63 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain the grade levels experienced woodworking teachers in Illinois recommend that various machines be operated and related subject be taught.

Source of Data: Data were secured by check lists sent to eighty experienced woodworking teachers throughout the state of Illinois and visitations to ten of the centrally located schools.

Findings and Conclusions: The band saw, jig saw, lathe, and power grinder were generally operated by sophomores. There was considerable doubt about the wisdom of permitting sophomores to operate the circular saw, jointer, and planer. The majority considered

the operation of the shaper, router, and radial saw too advanced for even juniors and seniors in high school.

1606. BACKUS, WILLARD R. (Masters). *Instructional Analysis of Woodworking Hand Tool Processes with Related Information Concerning Properties and Uses of Wood.* University of Michigan, 1940.

1607. BARLOGA, F. L. (Masters). *Design in Cabinet Making (a Unit in Industrial Arts Teaching).* Iowa State College, 1934.

1608. BENZEL, B. B. (M. A.). *Principles of Science Involved in Woodwork and Wood Finishing Processes.* Colorado State College of Education, 1938, 86 p.

An analysis of textbooks and projects in woodwork and wood finishing to discover the principles of science involved.

1609. BOGGUS, JASPER WAYMEN (M. A.). *A Proposed Course of Study for Woodwork in the Junior High Schools of San Antonio, Texas.* Southwest Texas State Teachers College, 1939. 121 p.

Suggests courses in woodwork using the project method and emphasizing manipulative skills and related information.

1610. BROADBENT, VERNON E. (M. A.). *A Four Year Course in Woodwork for a Comprehensive High School.* Stanford University, 1940. 330 p.

A suggested outline for a four-year course of study of high school woodwork. A brief history of industrial arts, a guide for selecting shop equipment, and methods for organizing and managing woodworking classes are included.

1611. BUSH, LAURENCE S. (M. S.). *Transmuted Woods.* The Stout Institute, 1948. 77 p.

A survey of seventeen manufacturers of transmuted woods to determine the properties, working qualities, uses, sources, and costs of such products, and their availability for school purposes.

1612. BUSH, ZELPHIA. *To Determine as many Distinguishing Characteristics as Possible of Wood-Carving Designs of Other Nations.* M. S., North Texas State College, 1941. 79 p.

An attempt to ascertain the distinguishing characteristics of wood-carving designs of various countries.

1613. CALTRIDER, SAMUEL PRESTON (M. A.). *Related Information for the Woodworking Shop.* University of Maryland, 1939. 156 p.

An analysis of course of study material in high school woodworking. The author compiles material for related information in woodworking and presents specific means by which this material may be used in the high school curriculum.

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1614. CAPRON, JOHN HUGH. *Wood Laminating and its Implications for Industrial Arts.* Ed. D., 1955, University of Florida. 161 p. College of Education, University of Florida, Gainesville.

***Purpose:* To compile information about wood laminating so the average industrial arts teacher can acquire first hand information about it.**

***Source of Data:* Data were secured from reports, articles, unpublished material, and correspondence with commercial wood laminaters.**

***Findings and Conclusions:* Elementary experiences in wood laminating do not require specialized, expensive equipment or highly developed skills.**

1615. CORBIN, WILLIAM EMERY (M. S.). *Wood-Finishing Practices and Conditions in Industrial Arts Laboratories of Northeastern Illinois.* Iowa State College, 1938. 61 p.

A study of the schools in Northeastern Illinois offering industrial arts or manual training courses and having an enrollment of one hundred to one thousand pupils. Topics such as number and length of classes, use of class time, teaching methods, finishing processes, and storage space are treated.

1616. DAVIDSON, WILLIAM L. *Wood Finishing in Industrial Arts Woodworking.* M. S., 1953, University of Tennessee. 96 p. Library, University of Tennessee, Knoxville.

***Purpose:* To present material about wood finishing in the industrial arts shop.**

Source of Data: Data were secured by consulting authorities in the field of wood finishing.

Findings and Conclusions: The type of wood is a prime factor in determining the finish to be used. The preparation of the surface prior to finishing is of utmost importance. A wide variety of wood stains are available. Wood fillers are discussed along with the techniques for using various transparent finishes. Proper storage methods are presented.

1617. DAVIS, WENDELL K. (M. Ed.). *Basic Units of Instruction for a Trade Preparatory Course in Cabinet Making.* Colorado Agricultural & Mechanical College, 1948. 106 p.

A review of the philosophy of vocational education and a survey of thirteen establishments in Decatur, Illinois. A course of study, including basic jobs and instructional units of each job, is prepared.

1618. De ROCKER, MEDARD O. J. (Masters). *A Course in Woodwork and Woodfinishing.* University of Hawaii, 1935. 147 p.

1619. DILLAHUNT, STEWART. *A Course of Study for Woodshop Classes in the Roosevelt Junior High School, San Diego, California.* M. S., University of Southern California, 1947. 94 p.

A course of study for seventh grade woodshop based on the exploratory aims of industrial education.

1620. DISHNOW, FRANCIS J. *Suggested Plan for Preparation of a Resource Unit for General Woodwork in Wisconsin Schools.* M. S., 1952, Stout State College. 114 p. Library, Stout State College, Menomonie, Wis.

Purpose: To present a plan for the preparation of a resource unit for general woodwork.

Source of Data: Data were obtained from a review of literature.

Findings and Conclusions: Six basic divisions of a resource unit are presented. They are the significance of the topic, a brief outline of the topic, possible outcomes, inventory of possible activities, evaluation suggestions, and materials for reference purposes.

1621. DUNAHOO, JOHN M. *Related Information for a Course of Study in Woodwork in Industrial Education.* M. S., 1950, East Texas State Teachers College. 142 p. Library, East Texas State Teachers College, Commerce.

Purpose: To find and organize related information concerning the source, process of manufacture, quality, use and care of the materials and tools common to the wood shop.

Source of Data: Data were secured from text books, reference books, encyclopedias, publications of learned organizations, and unpublished articles.

Findings and Conclusions: Forests are important in the development of modern civilization. Planning and designing are essential in woodwork. Safety is a "must" in the wood shop. What supplies and equipment are needed and how to buy them must be known by the woodworker.

1622. EDDINGS, WILLIAM GEORGE. *Clamping Pressures and Types of Glues in Determining the Strength of Glue Joints When Used on Oak.* M. S., 1954, Iowa State College. 53 p. Library, Iowa State College, Ames.

Purpose: To ascertain the best glue for red and white oak to compare the strength of joints produced by three different clamping pressures, and the strength of glue bonds of five different types of glue.

Source of Data: Data were secured through experiments conducted in the shop at Fairfield High School and Iowa State College.

Findings and Conclusions: The strongest joints occurred at medium clamping pressures. Liquid hide glue produced the strongest joints on white oak at 25 pounds per square inch clamping pressure. Urea resin and resorcinal resin produced the strongest joints on white oak at 75 pounds per square inch clamping pressure. Polyvinyl resin glue produced the strongest joints on white oak at 50 pounds per square inch clamping pressure.

1623. FERNS, EARL A. (M. S.). *A Reading Vocabulary in Patternmaking Based on an Analysis of the Content of Patternmaking Textbooks.* Iowa State College, 1937. 103 p.

An investigation covering 155,884 running words to determine a list of words commonly used in patternmaking books which are used as text or reference material in junior and senior high school patternmaking classes.

1624. FORD, WILLIAM G. *Woodwork Project Selection.* M. S., 1952, Stout State College. 89 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the methods used in selecting projects for woodworking classes in the high schools of Kansas.

Source of Data: Data were obtained by a survey of literature and a questionnaire.

Findings and Conclusions: The survey revealed the "pupil interest" was the most important factor in project selection. The instructors are more interested in quality of work done by their students than in the quantity of projects.

1625. FORSYTHE, LOREN PORTER (M. S.). *A Study of the Content of Courses in Bench Woodwork as Recommended in Authoritative Sources.* A & M College of Texas, 1939. 54 p.

A critical examination of the course content in beginning woodwork as taught in the schools of Texas in 1939, with recommendations for enriching the work.

1626. GARD, THERON D. (Masters). *Analysis of Related Information Taught in Junior High School Woodworking.* Iowa State College, 1934.

1627. GILSON, JOHN G. (M. S.). *Content for a Course in Related Science for Woodworkers.* Iowa State College, 1933. 78 p.

An outline of suggested content for a course in related science for students of woodworking trades. The course is based on an analysis of science and woodworking textbooks.

1628. GROVES, EDWIN DONALD. *Wood Turning Design in Period Furniture.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 60 p.

An analysis of 33 full page photographs including copies of turning details and pictures of antiques including turnings to study the turning designs.

1629. HAND, FREDERIC ABRAHAM. *Utilizing Pacific Coast Hardwoods in the Public School Industrial Arts Program.* M. S., 1954, Oregon State College. 144 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the extent to which Pacific Coast hardwords and larger shrubs can be utilized for project construction in the public school industrial arts program, and to analyze the problems of securing, cutting, seasoning, and storing these hardwoods.

Source of Data: Data were secured from libraries, resource specialists and experimentation.

Findings and Conclusions: Many of the Pacific Coast hardwoods can be used satisfactorily for project construction in the industrial arts shops. Woodworking teachers are interested but utilize these hardwoods on a limited scale because of a lack of time to secure, cut, and season the material.

1630. HANSEN, PAUL B. (M. S.). *An Evaulation of Instructional Units in Woodwork.* The Stout Institute, 1947. 41 p.

By checking the opinions of twenty-two woodwork teachers concerning desirable units of instruction for woodwork against the frequency of appearance of these units in textbooks, the writer provided a series of instruments to aid the teacher in the organization or improvement of woodwork courses of study and in the selection of texts.

1631. HARLESS, LUTHER HAROLD. *A Study of the Habitat, The Properties, The Physical Characteristics and the Uses of Woods Used in Industry and in Industrial Arts Programs in the North Texas Area.* M. S., 1953, North Texas State College. 150 p. Library, North Texas State College, Denton.

Purpose: To assemble information pertaining to the habitat, properties, physical characteristics, and supply of the woods available, and to ascertain the various types of wood used for projects in industrial arts.

Source of Data: Data were obtained from books, pamphlets, leaflets, and bulletins.

Findings and Conclusions: Textbooks recommended for industrial arts in the junior and senior high school grades do not have sufficient information concerning the habitat, properties, and physical characteristics of woods. Many of the woods are not used to their greatest advantage.

1632. HARTZLER, M. D. (Masters). *Plywood as Content in Industrial Arts.* Ohio State University, 1945.

1633. HINTON, JAMES M. *An Advanced Course in Industrial Arts Woodwork For Christenberry Junior High School, Knoxville, Tennessee.* M. S., 1953, University of Tennessee. 112 p. Library, University of Tennessee, Knoxville.

Purpose: To prepare a course in advanced woodwork for the Christenberry Junior High School, Knoxville, Tennessee.

Source of Data: Data were secured from courses of study from selected schools together with courses of study prepared in the Knoxville workshop.

Findings and Conclusions: A course outline is included with a list of suggested projects, and safety factors to be observed in the care and use of power machines.

1634. JELINCIC, JOSEPH JOHN. *New One-Coat and Special Synthetic Finishes Developed Since World War II.* M. A., 1955, Chico State College. 74 p. Library, Chico State College, Chico, Calif.

Purpose: To compile information on some of the newer developments in synthetic and one-coat finishes and to encourage their use by the high school shop instructor.

Source of Data: Data were obtained from publications and letters received from manufacturers.

Findings and Conclusions: Synthetics and one-coat finishes should be used by students because of their ease of applying, speed in drying, and high quality finish.

1635. JENKINS, THOMAS S. (M. S.). *Common Woodfinishing Practices in High School Shops of Iowa.* Iowa State College, 1934. 45 p.

An investigation of woodfinishing problems in thirty-six high school shops of Iowa. Recommendations for improvement of woodfinishing are offered.

1636. JOHNSON, ALBERT EMIL (M. S.). *Organization of General Woodwork Content.* The Stout Institute, 1939. 110 p.

A study of the trends in course content in general woodwork for elementary, junior high, and senior high schools. It is based on a survey of literature and experiences of the student teachers taking such courses at The Stout Institute, Menomonie, Wisconsin, in the summer of 1938.

1637. JONES, CASEY STACEY (M. S.). *A Survey of Occupational Information Related to Woodwork in Industrial Arts Classes.* Oregon State College, 1942. 60 p.

A study, based on data gathered from Oregon, Washington, Iowa, and Wisconsin, which considers such factors as the correlation of industrial arts with other subjects in the curriculum, and the need for occupational information for teaching purposes.

1638. JONES, ROLAND (M. S.). *To Determine What Related Information is Being Taught in the Junior High School Woodwork Shops of Texas.* North Texas State College, 1948. 54 p.

A survey of informational content taught in junior high woodworking in Texas in 1947. Skill versus informational content and suggestions for a balanced program are discussed.

1639. KILIP, WILFRED F. (Masters). *Suggested Instructional Units in Hand Woodworking for Ninth Grade.* Arizona State College, 1941.

1640. KINGSLEY, ROBERT L. *Wood Finishes and Finishing Materials Used in Oklahoma High Schools.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 61 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To inventory the wood finishes, finishing materials, and finishing processes as used in industrial arts classes in selected Oklahoma high schools.

Source of Data: Data were obtained by a questionnaire sent to shop teachers of the state.

Findings and Conclusions: A knowledge of wood finishes, finishing materials, and the procedures necessary to finish a project should be made an integral part of the industrial arts program for high school students.

1641. LAKE, DONALD WILBUR. *A Related Course for the Study of Period Furniture for Industrial Arts and Home Economics Classes.* M. S. in Ind. Ed., Kansas State Teachers College, 1940. 45 p.

Contains blueprints of typical pieces of each period discussed and a chart giving the principal characteristics of period styles of furniture.

1642. LEE, FLOYD W. (M. S.). *Selection and Evaluation of Related Information Pertaining to Woodworking in Thirty Senior High Schools of Illinois.* The Stout Institute, 1940. 48 p.

Through a questionnaire survey of industrial arts teachers and consumers in thirty cities in Illinois, the writer listed popular topics of related information pertaining to woodwork. Special emphasis is on the placement of these topics in teaching units, on their contribution to general education, and on their consumer value.

1643. LEWIS, PAUL D. (Masters). *Development of a Course of Study for Beginners in Wood Turning.* University of Cincinnati, 1942.

1644. LoVETTE, DALLAS D. (M. A.). *Development of Technique in American Woodcarving.* Colorado State College of Education, 1940. 113 p.

An investigation presenting woods, tools, kinds of carving, and finishing of woodcarving, as well as a brief historical sketch of woodcarving.

1645. MACDONNELL, GORDON A. *Types of Spline Construction Suitable for Industrial Arts Woodworking Projects.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 85 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To identify and compile information on the various types of spline construction in woodwork which may be adapted to the needs of industrial arts classes.

Source of Data: Data were obtained through books, magazine articles and manufacturers' literature.

Findings and Conclusions: Spline construction is more easily adapted to the needs of contemporary design than many of the more traditional forms of construction.

1646. MAINOUS, CLAYTON G. (M. S.). *Teaching Units in Bench Woodwork.* Louisiana State University and A & M College, 1944. 196 p.

A compilation of illustrated and written instruction sheets for teaching bench woodwork. Eighty operation sheets and four information sheets were developed.

1647. McKINLEY, FOWLER E. (M. S.). *Related Information Taught In Ninth and Tenth Grade Woodworking in Illinois.* Iowa State College, 1936. 70 p.

A survey to discover the relative emphasis given various topics or related information taught by the woodworking teachers in high schools of the State of Illinois, except those of Cook County.

1648. NELSON, ERNEST BURT. *Bent Laminated Projects For Industrial Arts Shops.* M. A., 1953, University of Minnesota. 164 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To compile technical information needed to introduce the bent lamination process to the school shop.

Source of Data: Data were obtained from the Forest Products Laboratory, industry, and other research agencies.

Findings and Conclusions: Some of the same principles used by industry can be applied to smaller projects made by students in the school shop. The study contains illustrations and drawings of a wide variety of bent laminated projects, together with working drawings of the necessary jigs and fixtures.

1649. NUZMAN, LOREN M. (M. Ed). *Adaptation of Tenth Grade Woodworking to Modern Industrial and Educational Trends.* Colorado Agricultural & Mechanical College, 1945. 213 p.

An investigation of present educational and industrial trends to determine the content and method of tenth grade woodwork. A course of study, including assignment sheets and lesson plans, is included.

1650. OLSON, NORMAN CARL (M. S.). *A Syllabus for a Course in General Woodworking in a Junior High School.* University of Southern California, 1947. 63 p.

A syllabus designed for general woodworking in an industrial arts department of a junior high school.

1651. ORR, THOMAS JAMES (M. A.). *Illustrated Woodworking Projects for the Junior High School.* Stanford University, 1947. 239 p.

A study of current trends in teaching woodworking aimed to improve the project design of woodworking projects. Workable drawings and photographs for eighteen woodworking projects are included.

1652. PETERSEN, RUSSEL VERNON. *A Junior High School Course of Study for Woodworking.* M. S. in Ed., 1949, University of Southern

California. 149 p. Education Library, University of Southern California, Los Angeles.

Purpose: To set up a 10-weeks exploratory course in seventh grade woodworking.

Source of Data: An analysis of processes concerned and projects to fit those processes.

Findings and Conclusions: Development of a course of study in terms of projects to utilize the necessary processes. Drawings and diagrams of the projects are included. The course outline developed is highly flexible.

1653. PETERSON, CARL B. *A Study of Courses of Study in First Year Senior High School Woodwork in Fifteen Selected California Cities.* M. A., 1954, Fresno State College. 135 p. Division of Fine and Practical Arts, Fresno State College, Fresno, Calif.

Purpose: To analyze courses of study in first year senior high school woodwork, and to discover their relative merits.

Source of Data: Data were obtained from courses of study from fifteen California cities.

Findings and Conclusions: There is a definite need of a more complete listing of aims in certain courses of study. A more complete listing of skills and processes is also needed. Not all courses of study include the making of working drawings. Only half of the courses of study listed related information pertaining to safety.

1654. PIERSON, DONLEY A. *Junior High School Woodworking.* M. A., University of Minnesota, 1945. 76 p.

An analysis of procedures under varying school objectives as to the effectiveness of industrial arts woodworking.

1655. POPPENBERG, JOHN A. *Student Views on Woodworking.* M. A., 1949. University of Minnesota. 107 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To assess pupil opinion as to industrial arts teaching methods and arrangements.

Source of Data: Questionnaire procedure.

Findings and Conclusions: Suggestion of more visual aids, more individual instruction sheets, better shop management practices, more emphasis.

1656. PREWETT, CHRYL H. (Masters). *Applied Physics Experiments for Related Woodworking Trades.* Oklahoma A & M College, 1938.

1657. RADTKE, ROY A. (Masters). *Course in Woodwork for the Junior High School.* University of Wisconsin, 1935.

1658. RATHBUN, JESSIE EARL (M. A.). *A Course of Study for Bench Woodwork.* Stanford University, 1935. 284 p.

This outline for a course of study for beginning woodwork consists of seven instructional units. Each unit includes a discussion of aims, tools and materials, methods of determining pupils' previous knowledge and what remains to be taught, and procedure.

1659. REID, DEMPSEY ELLIS. *A Proposed Plan for the Teaching of Elementary Woodworking.* M. S., 1948, Illinois State Normal University. 97 p. Library, Illinois State Normal University, Normal.

Purpose: To propose a plan for the selection, organization, and presentation of subject matter for a course in elementary woodworking.

Source of Data: Data were obtained from an analysis of the purposes of elementary education and the purposes, trends, and needs of industrial arts.

Findings and Conclusions: Subject matter for elementary woodworking should include more than just manual skills and industrial information. It should be integrated, meet the needs of the boys, and be in line with their wants and interests.

1660. RICE, VERN JAMES (M. S.). *A Study to Determine the Technical Information About Carpentry and Cabinetmaking Possessed by High School Students.* University of Southern California, 1937. 118 p.

A study of the technical trade knowledge shown by high school seniors as compared with the basic information needed in the trade.

1661. RICHARD, EDMOND LOUIS, Jr. *Related Information Taught in Woodworking Courses.* M. S., 1953, Louisiana State University. 208 p. Library, Louisiana State University, Baton Rouge.

Purpose: To ascertain the related informational topics that should be presented in secondary woodworking courses in Louisiana.

Source of Data: Data were obtained from questionnaires sent to 72 white industrial arts teachers in Louisiana.

Findings and Conclusions: Instructors should prepare courses of study keyed to textbooks. Regular class lectures and demonstrations should be given on assigned days. More instructors should use instruction sheets. Examinations should be given at regular intervals. Adequate numbers of textbooks and library materials should be provided. Basic library materials should be located in the shop. More visual materials should be used. More written work should be required. Adequate space should be made for displays in the shop. A minimum list of informational topics to be presented in secondary woodworking courses was recommended.

1662. ROANE, HERBERT EUGENE. *A Comprehensive Study of Furniture Construction Methods, Types and Designs.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 55 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To identify the component parts of furniture construction that go together to make it a useful activity in industrial arts instruction.

Source of Data: Data were obtained from books, pamphlets from furniture manufacturers, and theses.

Findings and Conclusions: Much of the basic design used today in furniture has come through many centuries of development. Each generation has made some progress in the construction and design of furniture. Advancement is much more rapid at present with increasing technology.

1663. SMITH, MERRILL EATON. *Effect of Clamping Pressures on Strength of Glue Joints Used in Industrial Arts Shops.* M. S., 1953, Iowa State College. 53 p. Library, Iowa State College, Ames.

Purpose: To ascertain the most effective clamping pressures for various species of wood with three types of glue.

Source of Data: Data were obtained from specimens prepared, glued, and broken in the Industrial Arts and Engineering laboratories at Iowa State College. The woods used were maple, walnut, and white pine. The glues used were urea resin, polyvinyl and liquid hide. The pressures used were 25, 50, 75, and 100 PSI.

Findings and Conclusions: Generally the strongest joints were obtained at medium clamping pressures. The only exception being maple with polyvinyl glue, where more pressure should be applied. The use to be made of the joint should determine the choice of glue.

1664. SMYTH, LEON L. (Masters). *Related Technical Information for First Year Industrial Arts Classes in Woodwork.* A & M College of Texas, 1940.

1665. SPRAY, JOHN H. *A Beginning Course in Industrial Arts Woodwork for the Memphis City Schools.* M. S., 1953, University of Tennessee. 128 p. Library, University of Tennessee, Knoxville.

Purpose: To develop a beginning course in industrial arts woodwork for the Memphis public schools.

Source of Data: Data were secured from the minutes of the Memphis Board of Education, school records and published materials.

Findings and Conclusions: In Memphis there were 125 firms engaged in woodworking, employing more than one sixth of the total number of persons engaged in manufacturing industries. Included in the report is a course of study in outline form, with suggested equipment.

1666. STOREY, MARSHALL A. *Furniture Finishing.* M. Ed., 1949, Agricultural and Mechanical College of Texas. 35 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To present to the industrial arts teacher and home craftsman the most important steps in good furniture finishing along with certain characteristics of good finishes.

Source of Data: A survey of literature was made to learn the characteristics of wood, the knowledge of which is required for successful wood finishing and to ascertain which finishes are best suited to the conditions of the industrial arts and home workshops. Finishes deemed must suitable for use under these conditions were then reproduced to determine whether they were applicable.

Findings and Conclusions: A summary includes the most important steps in good furniture finishing and the characteristics of good finishes.

1667. **SUGGS, JAMES R.** *A Study of Wood Turning Materials Found in Woodworking Books.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 58 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To make a study of the many woodworking books which may be used in the school shop either as a textbook or as a reference, and review the material concerning wood turning. To evaluate this material; and to classify the material as to the type of instruction which the author intends to convey to the user.

Source of Data: Library research coupled with periodical literature sent out by manufacturers of woodworking materials and machinery.

Findings and Conclusions: The material found in the literature on wood turning is inadequate to meet the needs of classroom instruction on the high school level. Much of the literature contains information that is suitable for the basic principles of turning, but there is a need for revision in the projects that are presented.

1668. **THIEL, ERNEST RICHARD** (M. A.). *A Determination of the Related-Subjects Content For the Cabinetmaker's Trade.* Indiana University, 1934. 185 p.

This study was made during 1934–1935, and organizes the related technical subject matter for the cabinetmaker's trade into twenty-five major divisions for use in a vocational training curriculum for the occupation indicated.

1669. **THOMAS, ROBERT W.** *A Proposed Resource Unit for General Woodwork in the Junior High School Industrial Arts Program in the State of Wisconsin.* M. S., 1949, The Stout Institute. 98 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: The purpose of the study was to propose a sample resource unit for general woodwork in the junior high school industrial arts program in the State of Wisconsin.

Source of Data: The investigation was primarily a library study including a survey of the literature about resource units, industrial arts objectives for Wisconsin, specific objectives for general woodwork in the junior high schools, units of general woodwork to fulfill the specific objectives, and methods of instruction.

Findings and Conclusions: A sample resource unit, "projects for the home," was selected and certain topics from the broad general list were developed for this unit. The significance of the topic, brief outline of the topic, possible outcomes, inventory of possible activities, evaluation suggestions, list of materials for reference purposes, and sources of supplies, materials, and equipment: All are included in the sample resource unit. It was recommended that the study be edited and submitted to the Statewide Industrial Arts Committee of the Wisconsin Cooperative Educational Planning Program for evaluation and use.

1670. **THORSON, OSCAR MARTIN** (Masters). *Technical Information for Woodworking in Junior High Schools.* Iowa State College, 1939.

1671. **TRAVER, GORDON ANDERSON.** *Possibilities For Improvement in the Course in Woodworking Now Being Offered in the Secondary Schools of Middle Tennessee.* M. A., 1952, Middle Tennessee State College. 83 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the possibilities for improving the woodworking courses being offered in the secondary schools of Tennessee.

Source of Data: Data were secured through questionnaires and visits to industrial arts shops in Middle Tennessee. Methods used in teaching woodworking were examined and compared with methods recommended by accepted authorities in the field of industrial arts.

Findings and Conclusions: Teachers were qualified to teach woodworking, but could profit by supervisory assistance. Ample time is being devoted to both manipulative skills and related information. Too few courses of study and progress charts were in evidence. More visual aids, more books and magazines, and more group projects should be used.

1672. **VEGA, SECUNDINO** (Masters) *Furniture Design: Materials for a Course of Study.* Ohio State University, 1939.

1673. **VITZ, MARTIN G.** *Development of Wood Finishes and Wood Finishing.* M. S., 1949, The Stout Institute. 114 p. The Stout Institute, Menomonie, Wis.

Purpose: To gather material on the development of wood finishes and wood finishing.

Source of Data: The methods of research used were historical, using library reference material, and letter of inquiry to 61 manufacturing concerns and Federal Government offices.

Findings and Conclusions: Early knowledge and records are very limited. The material received from manufacturing concerns was of such a technical nature that little of it could be used in the study. The finishing schedules included in the study are samples, intended only to show a few of the many ways of finishing. The following is recommended: Students be given information regarding the background of wood finishes. Teachers of wood finishing use this or other like material as an outline for developing class material on the background of wood finishes and wood finishing. Research be made in these areas: Special finishing methods, relationship of wood finishes to wood finishing.

1674. WEBER, RALPH E. (M. S.). *Review of Literature Dealing with Related Subject Matter Information For Junior High School Woodworking.* Iowa State College, 1940. 71 p.

A study to discover what related information was being taught and what should be added.

1675. WILEY, CLAYTON. *Content of Carpentry for General Woodworking at the Junior High School Level.* M. Ed., 1950, Wayne University. 23 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To select instructional units in carpentry at the junior high school level for a course in general woodwork which would provide experiences in home maintenance and exploratory experience in the building trades.

Source of Data: Data were obtained from standard texts and a committee of Detroit teachers.

Findings and Conclusions: Most courses in general woodworking should include a unit of carpentry which is one of the representative activities in the woodworking field. Information on construction should be obtained by individual, or group, field trips, with observation reports to be filled out by the student to be sure he gets the desired information.

1676. WILLIAMS, L. B. *An Evaluation of Objectives and Major Activities For General Woodworking.* M. Ed., 1955, Wayne University. 48 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the desirability of certain woodworking activities in light of aims and objectives previously set up.

Source of Data: Data were obtained from a questionnaire and a rating scale.

Findings and Conclusions: The aims and objectives set up were considered quite sound, but one addition was suggested. Specific activities on the list that were rated as being of little value were wood carving and archery. Hand woodworking, on the other hand, was rated very high.

1677. WINBURN, HAROLD J. *Lacquer and Lacquering.* M. S., Oklahoma Agricultural and Mechanical College. 66 p. Graduate School, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To trace the history and development of lacquer and to describe its characteristics, applications, and the equipment necessary for its use.

Source of Data: Data were obtained from books, magazines, and pamphlets.

Findings and Conclusions: Present lacquers are quite different in composition and characteristics from early lacquers used by craftsmen in the Orient. In order to keep pace with the finishing industry, industrial arts departments should install spray equipment.

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1678. WRIGHT, OSCAR WILDE. *The Formulation of a Resource Unit of Teaching Aids for the Industrial Arts Woodworking Shop on the High School Level in New York City.* Ed. D., 1954, New York University. 445 p. Library, New York University, New York.*

Purpose: To develop a reference book of teaching aids for the industrial arts general woodworking shop on the high school level.

Source of Data: A survey was made to determine what instructional aids were needed for the teaching of industrial arts woodworking on the high school level in N. Y. C. Guided by this survey, the investigator collected, adopted, or constructed one hundred and eighty-six teaching aids to fit the course requirements. An evaluative study was made to ascertain whether the developed teaching aids met the needs of the industrial arts teacher in the high schools of New York City. A panel of thirty teachers rated this material.

Findings and Conclusions: The returns from the rating committee indicated that 84.2 per cent of the material was judged by agreement as from good to excellent. The document in-

dicates a method for the development of teaching aids for other subject areas in industrial arts. The evidence derived from 246 collective evaluations of the assembled teaching aids appears to indicate that such a resource unit may contribute to the expressed needs of the New York City high school industrial arts teacher.

Curriculum

1679. AIKEN, WARREN R. ***Air Transportation: A Content Analysis to Determine Curriculum Emphasis for Industrial Arts.*** **M. A., 1950, Ohio State University. 110 p. Library, Ohio State University, Columbus.**

Purposes: **To survey the air transportation section of the transportation division of industrial arts, and to suggest curriculum emphasis.**

Source of Data: **Survey of the air transportation field through direct contact with air transportation and education and analysis of the literature.**

Findings and Conclusions: **Within the realm of air transportation lie many topics that could claim the attention of students from kindergarten to adult levels of education. The many materials, processes and products and the range in degrees of complexity of expression which is possible, offer the curriculum builder an opportunity to develop a program that is pertinent and stimulating.**

1680. ALMENDINGER, JOSEPH J. (M. Ed.). ***An Improved Course of Study of Industrial Arts.*** **University of Buffalo, 1942.**

1681. ALTERMAN, ROLLAND AUGUST. ***Industrial Arts on Elementary Levels With Special Reference to Horace Mann Laboratory School.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1946. 179 p.**

An industrial arts curriculum for the elementary school. Photos, blueprints, plans, and detailed information for the development of elementary level programs are given.

1682. ANDERSON, MILES H. (M. A.). ***The Development of Job and Occupational Analysis With Particular Reference to Their Applications in Trade and Industrial Education.*** **University of California, Berkeley, 1947. 112 p.**

A study of the place of occupational analysis in curriculum construction in trade and industrial subjects.

1683. ANDERSON, WILLIAM R. (M. A.). ***State Syllabi in Industrial Arts.*** **University of Minnesota, 1945. 53 p.**

An analysis of the available 1945 state syllabi or courses of study in industrial arts subjects, including their content, organization, and mechanical features. A summary and recommendations for future publications of this nature are included.

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1684. BAS, RADHA C. ***An Analytical Study of Electrical Curricula in Selected Technical Institutes of Northeastern United States.*** **Ph. D., 1950, Cornell University. 204 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: **To determine the nature and content of electrical curricula in the technical institutes of northeastern United States.**

Source of Data: **Data were obtained from published, typewritten and mimeographed material, and interviews of faculty of technical institutes.**

Findings and Conclusions: **In order of frequency the institutes included are: State supported, proprietary, privately endowed, and extension divisions of universities. The total enrollment in these institutes varies from 55 to 2,024 with a median of 495; the enrollment in electrical curricula ranges from 9 to 1,296 with a median of 112. Electrical curricula offered in technical institutes are broadly of 4 types: Electrical technology, electrical power and machinery, electrical communications, and industrial electronics.**

1685. BELTON, WAYNE LEROY. ***Transportation: A Content Study for Industrial Arts.*** **M.A., 1949, Ohio State University. 87 p. Education Library, Ohio State University, Columbus.**

Purpose: **To reveal some of the contributions of transportation in a modern society.**

Source of data: **A review of existing literature.**

Findings and conclusions: **Transportation affects the lives of everyone and has a con-**

tribution to make in a comprehensive program of industrial arts.

1686. BERGSTROM, JOHN A. (M.S.). *Correlative Constants in the Major Fields of Woodwork.* Iowa State College, 1933. 60 p.

An attempt to obtain a master outline for a course of study in the fundamentals of woodworking, cabinetmaking, carpentry, and patternmaking.

1687. BLEKKINK, JAMES W. *A Proposed Pupil Personnel Service for the Secondary Schools of Chippewa Falls, Wisconsin.* M.S., 1950, The Stout Institute. 91 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To analyze the existing conditions and to show ways in which the pupil personnel services of the secondary schools of Chippewa Falls, Wisconsin, can be improved.

Source of data: The method of research used was the normative survey, using a type of questionnaire inquiry. A survey was made to determine what points of improvement the faculty considered essential to the development of a feasible plan.

Findings and conclusions: Tools for the development and a plan for action to be carried out over a period of years are suggested.

1688. BOURNE, M. NILE (M.A.). *A Curriculum Study of the General Shop.* Colorado State College of Education, 1937. 91 p.

A comprehensive study of the general shop, including subjects taught, objectives, types of general shops, and size of schools where general shops are found.

1689. BOYD, LESTER E. *Local Industrial Arts Resources Pertinent to Schools of Pinellas County.* M.A. in Ed., 1950, University of Florida. 97 p. Library, University of Florida, Gainesville.

Purpose: To give a comprehensive view of the resources of Pinellas County which may contribute to the enrichment of the industrial arts program.

Source of data: Data were secured through a questionnaire to industrial arts teachers, conferences, and from various public and civic publications.

Findings and conclusions: Utilization of Pinellas County resources in the industrial arts is unsatisfactory and teachers agree that corrective steps must be taken. Benefits will accrue, both to the children of the county and to the community. Transportation is needed for visiting industries and exploring community resources. All industrial arts teachers need information concerning resources.

1690. BRANT, ELDON. *Use of Community Resources in Industrial Arts Instruction.* M.A., 1950, University of Minnesota. 110 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To develop a method of up-grading instruction to meet the needs of present day youth.

Source of data: Survey of related literature and results of a survey of drop-outs from senior high school at Winona, Minnesota.

Findings and conclusions: More real-life contact with community resources is needed, using industrial arts as the medium. This can be done exceptionally well in the industrial arts program.

1691. BUFORD, CLARENCE RAYELUS (M. A.). *The Vocational Curriculum for Lincoln High School in Waurika, Oklahoma.* Colorado State College of Education, 1941. 71 p.

A curriculum re-organization study based on community needs. The curriculum was evaluated by colleges that students anticipated attending, and the construction of a vocational program was based on suggestions of potential employers.

1692. CHRISMAN, PAUL G. (Masters). *A Course of Study for Industrial Arts in Rayster Junior High School, Chanute, Kansas.* Kansas State Teachers College, 1941.

1693. COMPTON, RICHARD A. *An Introduction to Industrial Arts with Specific Reference to Iowa State.* M. A., 1950, Ohio State University. 97 p. Education Library, Ohio State University, Columbus.

Purpose: To develop an introductory course for freshmen industrial arts students which will consider and present the important facts concerning teaching and industrial arts.

Source of Data: Selection of material considered to be most important and necessary for prospective teachers. Experienced industrial arts teacher trainers served as jurors in selecting pertinent phases of the program.

Findings and Conclusions: The profession should endeavor to reach a unified point of view regarding the importance of introductory courses.

1694. COOK, ORLAN P. *A Proposed Course of Study for Industrial Arts in South Dakota.* M. S., Iowa State College, 1930. 60 p.

A survey of the course content desirable in an industrial arts program.

1695. COON, ALICE DELLA (Masters). *Teaching the Industries of New England in Its Schools.* Boston University, 1933. 80 p.

1696. COOPER, EDWARD FRANKLIN (M. A.). *A Source Unit for Aeronautics in the Industrial Arts Program on the Secondary School Level.* University of Maryland, 1948. 120 p.

The author states his philosophy of education and the role of industrial arts within that philosophy. The field of aeronautics is analyzed and curriculum content is derived from the analysis.

1697. COYLE, JOHN PATRICK. *The Place of Industrial Arts Shop Courses in the Pre-Engineering Curriculum.* M. S. in Industrial Education, 1950, Kansas State Teachers College. 78 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To study the pre-engineering curricula of the junior colleges and colleges of Kansas to ascertain the possible relationship to industrial arts courses.

Source of Data: Survey of the junior colleges of Kansas, state colleges, and engineering colleges of Kansas, Oklahoma, Arkansas, and Missouri through bulletins, letters, and limited visitation.

Findings and Conclusions: Shopwork is not stressed to any great extent in any pre-engineering curriculum. The most common shop courses are welding, forging, pattern making, and machine shop. Engineering drawing and descriptive geometry are the drawing courses offered most frequently. Industrial arts and engineering can provide a technical or terminal curriculum for students who are likely to drop out of school and do not complete their engineering education.

1698. CROW, RICHARD R. (M. A.). *Power: As Content for Industrial Arts.* Ohio State University, 1938. 171 p.

An investigation of power and its relation to industrial arts. Sources, development and utilization, generation, transmission, and the social-economic effects of power development are included. Content material on power is developed, and its relation to industrial arts is stressed.

1699. DALLAS, JOHN W. (Masters). *Minimum Requirements and Course of Study for a Typical General Industrial School.* Oklahoma A. & M. College, 1935.

1700. DAY, JAMES A. *Special Activities Within the Industrial Arts Program of Detroit During 1952.* M. Ed., 1954, Wayne University. 25 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the amount of participation within the special activities that has been incorporated into the curriculum of the various types of shops.

Source of Data: Data were compiled by means of a questionnaire sent to all elementary, intermediate, and high schools having shop activities.

Findings and Conclusions: Suggestions are offered to stimulate continued growth of the programs and to determine which can be most successful in the various grade levels.

1701. DAY, RUFUS ALLAN (M. Ed.). *The Industrial Arts Program in Texas Schools, With Special Reference to Wichita Falls.* University of Texas, 1941. 155 p.

Comparison of Wichita Falls junior and senior high schools with those of thirteen other Texas communities of about the same size, concerning the subjects included in industrial arts, registrations therein, fees charged, and facilities. Recommendations for an expanded and improved program are offered.

1702. DETTINGER, DONALD J. *A Transportation Unit as a Medium of Instruction in Industrial Arts.* M. S., 1949, Oregon State College. 88 p. Library, Oregon State College, Corvallis.

Purpose: To investigate the program of automotive instruction in high schools in the Central San Joaquin Valley, California.

Source of Data: Interviews, questionnaire, and a study of pertinent literature.

Findings and Conclusions: The automobile is the core of the high school transportation unit. The program should be broad and flexible and provide for exploration and a degree of specialization. Teacher education should provide more technical and skill background and high schools should have a greater variety and scope of equipment.

1703. **DIETHRICH, ARTHUR B.** *A Proposed Resource Unit for Aviation in the Senior High School Industrial Arts Program for the State of Wisconsin.* M. S., 1949, The Stout Institute. 148 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To develop a resource unit for aviation suitable for use in the industrial arts programs of the senior high schools of Wisconsin. To determine what progress has been made in the field of aviation education. To divide aviation into areas which could become the subject of other resource units, and to determine which of the areas of aviation should be studied in industrial arts courses.

Source of Data: A survey and analysis of available material on aviation education, resource units, industrial arts courses in aviation, and aircraft propulsion was made. A documentary frequency analysis was made of available State programs, courses of study, and aviation textbooks.

Findings and Conclusions: The investigation disclosed that the effects of aviation on our civilization are apparently of sufficient importance to justify a comprehensive aviation education program in the curriculum. The division of aviation to be studied in industrial arts courses would be those which would involve the greatest utilization of industrial arts facilities. It was recommended that: Further investigation be made of the place of aviation education in the curriculum with particular reference to aviation as an industrial arts activity; greater attention be given to the field of transportation and mechanical power; and additional resource units be constructed for aviation as an area of industrial arts.

1704. **DOYLE, J. ARNOLD.** *The Development of A Curriculum in Basic Shopwork for the Department of Education, Province of Saskatchewan.* M. A., 1952, University of Minnesota. 94 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To set forth the procedure and technique actually followed in developing a basic shopwork curriculum for the composite high schools of Saskatchewan.

Source of Data: Data were obtained from the minutes of meetings of the Shopwork Curriculum Committee.

Findings and Conclusions: This paper summarizes the research underlying and the finished program of Studies for the Composite High School, Basic Shopwork.

1705. **EATON, SPENCER E. (M. S.).** *A Suggested Revision of the Curriculum in Industrial Teacher Education at Keene Teachers College, Keene, New Hampshire.* Pennsylvania State College, 1941. 64 p.

Examines the New Hampshire state program of study for industrial teacher training and organizes a program in Keene Teachers College in an effort to meet the changed needs of industrial education teachers.

1706. **EDSON, KENNETH M.** *A Teacher Outline of Related Subjects in Industrial Arts Comprehension.* M. S. in Ed., 1950, Cornell University. 108 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To develop a teacher's outline from which the related subjects in industrial arts may be taught.

Source of Data: Library research.

Findings and Conclusions: An outline was developed covering such subjects as: Safety rules, forest products, metals, ceramics, textiles, electricity, printing, rubber, plastics, abrasives, choosing a vocation, consumer education, and free films.

1707. **EISENHARD, CHARLES W.** (Masters). *The Practical Arts Courses in the Junior High Schools and in the Commercial Night Schools of Allentown, Pennsylvania.* New York University, 1931.

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1708. **EVANS, RUPERT NELSON.** *A Study of Psychological Factors Affecting Micrometer Measurement.* Ph. D., 1950, Purdue University. 74 p. Library, Purdue University, Lafayette, Indiana.

Purpose: To determine the possibilities of using micrometers as measuring instruments instead of gage blocks in the mass production of close fitting, interchangeable parts, and to determine the variations in the use of micrometers by individuals and the training needed to overcome these variations.

Source of Data: Difference limens (thresholds) for torque discrimination for 37 college students were compared with torque required for zero micrometer measurements. Accuracy of 28 journeymen and 32 apprentice toolmakers and machinists was determined, and divided into reading accuracy and setting accuracy. The accuracy of use of personal and of unfamiliar micrometer was compared. A brief training program in micrometer measurements was established using five college students as subjects.

Findings and Conclusions: The accuracy of micrometer measurements may be expressed in at least four ways, but these four measures of accuracy do not correlate well with each other. Errors in micrometer measurements made by skilled workers are considerably larger than is assumed by most authorities in the field, with the standard deviation of errors being remarkably constant at about .000227″. The average error (absolute) for the industrial population studied was .00015″. Measurements made by apprentices are apparently as accurate as those made by journeymen, and accuracy of measurements seems not to be significantly correlated for either group with age, amount of experience with the company, or length of time on the present job. There is apparently a tendency to underestimate the size of pieces measured with the one inch vernier micrometer, by about .00002″. In the population studied, the low difference limen for torque discrimination suggests that micrometers can be adjusted much more accurately than is usually the practice in industry. A short training program based primarily upon knowledge of results is effective in decreasing the gross size and variability of errors to approximately one-third that of the toolmakers and apprentices tested. The decrease in gross size and variability of errors brought about by the training program is apparently only temporary, suggesting that workers should be given training immediately before being expected to make accurate micrometer measurements.

1709. **FIERS, ALAN R.** *A Guide for A Special Course in Industrial Arts.* M. A., 1950, University of Minnesota. 114 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To explain the exploration concept to fields or areas not previously offered at Folwell Junior High School in Minneapolis, Minnesota.

Source of Data: Discussion of the course areas and possibilities, guidance, motivation, analysis for student needs, evaluation, and certain related problems.

Findings and Conclusions: In the period of adolescence boys meet many problems and need something or someone to start them and their interests toward a goal. Without a strong interest pattern in a large city, boys are likely to fall prey to crime. The shop program, and the efforts of other classmates and those of the teacher have helped.

1710. **FILIPPONE, NICKOLAS** (Masters). *A Study of the Vocational Industrial Curriculum for Building Construction (Carpentry) in the Philadelphia High Schools.* University of Pennsylvania, c. 1935–47.

1711. **FLETCHER, KENYON S.** (M. A.). *A Curriculum Survey in Industrial Arts.* University of Minnesota, 1935. 119 p.

A survey of industrial arts activities in the twenty-seven counties surrounding Illinois State Normal University for the purpose of implementing and improving the industrial arts teacher education program at this institution.

1712. **FORD, CHARLES ROSS.** *Industrial Arts in Alberta.* M. A., University of Minnesota, 1945. 99 p.

A survey of industrial arts as a curriculum area in the intermediate and high schools of the Province of Alberta.

1713. **FORMAGUS, NACE.** *Correlation of Industrial Arts in the Elementary Grades.* M. S., 1950, North Texas State College, 86 p. Library, North Texas State College, Denton.

Purpose: To develop and evaluate a program for the elementary schools of Texas in which industrial arts is correlated with the elementary curriculum.

Source of Data: A questionnaire was mailed to schools of different enrollments in different localities of Texas. The data obtained were tabulated into tables to show comprehensive results of the query. The information was supplemented by articles from magazines and by actual experimentation in the Laboratory School.

Findings and Conclusions: An industrial arts background is essential before attempting a program of correlation. Industrial arts can be correlated with the elementary curriculum. The teachers were of the opinion that the correlation of industrial arts with the elementary subjects would create a greater interest and student participation. Also, the teachers felt that industrial arts could aid the elementary teachers in reaching the objectives of general education.

1714. **FOX, GENEVIEVE L.** *The Vocational, Curricular, and Recreational Interests of Pupils of a Selected High School.* M. A., University of Michigan, 1940. 73 p.

An analysis of the interests of the pupils of Wyandotte (Mich.) High School to see if a relationship may be found between their curricular and vocational interests.

1715. **FRANCIS, GUY, Jr.** (M. A.). *Bases for Junior High Industrial Arts Program for Bluefield, West Virginia.* George Peabody College, 1933. 125 p.

The preparation of a program of industrial arts for junior high schools on the basis of the needs of the students determined by studies of the occupations into which the students go after leaving school and the occupations of the people of Bluefield.

1716. **FREEMAN, OTIS L.** (M. S.). *Analysis of the Worth and Usability of Industrial Arts Problems Made in the Schools of Memphis, Tennessee.* Iowa State College, 1933. 89 p.

A curriculum study to determine the content of the industrial arts shop courses of Memphis, Tennessee, and the usability of the content.

1717. **GARDNER, WILLIAM DOUGLAS.** *A Study of the Expressed Needs of Farmers As A Factor in the Construction of Vocational Courses for Negro Students in Washington County, Mississippi.* M.S., 1949, Mississippi State College. 59 p. Library, Mississippi State College, State College.

Purpose: To determine some of the present problems of farmers in the operation of their mechanized equipment; the vocational training necessary to meet the present and future needs of Washington County farmers; how well the existing Negro school system meets the vocational needs of the Negroes of Washington County; and how the problem can best be approached to reach a satisfactory solution for the future based on the expressed needs of farmers.

Source of Data: Data for developing the study were obtained through the use of a questionnaire sent to 500 selected farmers, a questionnaire filled out by all seniors at Coleman High School (Negro public school), a questionnaire filled out by 350 students at Southern Trade School (private school), and through a review of available literature and research studies on the subject.

Findings and Conclusions: Farmers are at a turning point in full mechanization of farms. Increased efficiency in the operation of equipment is the only way net profits can be continued. All farmers recognize the necessity of a sound elementary education program for Negroes, and all returns from the questionnaire indicated a need for more vocational training to be offered in the county. There is an immediate need for the organization of short intensive courses in Tractor Operation, Tractor Maintenance, and Cotton Picker Operation. Over 50 percent of the farmers expressed a willingness to pay wages to the operator and tuition to the school if such courses were offered. On an average, 20 percent of each day's work of the untrained operator is lost due to inefficiency and lack of knowledge. Farmers agreed to pay an average of 27 percent higher wages for trained operators. During the next five years, the implications are that 8,000 families will be displaced in Washington County due to mechanization of farms. Using data obtained from questionnaires to farmers as a factor and projecting it county wide, it was determined that over 3,800 trained operators are needed immediately to meet needs of the county. Plans should be developed immediately through the cooperative effort of the Delta Council and the local, county, and State school officials to inaugurate a long range plan for the development of vocational trade courses in the delta area.

1718. **GAYLORD, KARL E.** (Masters). *A Study of the Mathematics that Functions in the Common Vocations.* Iowa State College, 1931.

1719. **GERBRACHT, CARLTON JOHN.** *Communications: An Analysis to Determine Curriculum Emphasis for Industrial Arts Education.* M. A., 1948, Ohio State University. 168 p. Education Library, Ohio State University, Columbus.

Purpose: To determine how the products of inventive genius, in a technological sense, facilitate modern communication.

Source of Data: Examination of literature from companies engaged in research and manufacture and counsel of specialists in selected fields.

Findings and Conclusions: Presentation of the major methods of communication, with a view to revealing the salient aspects of each method. A style for teaching the more technical aspects of radio and suggestions for emphasis at various levels, commensurate with generally accepted industrial arts objectives.

1720. GULVIN, HAROLD (M. Ed.). *Bases for Curriculum Revision at Forestville, Particularly Pertaining to Vocational Courses for Boys.* University of Buffalo, 1946. 77 p.

A case study of 163 boys of rural high schools, both graduates and drop outs, in an effort to determine the reasons for drop outs and the need for curriculum revision.

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1721. HAMPTON, THOMAS EDGAR. *A Survey of Technical Occupations in Louisiana with Implications for Technical Education.* Ph. D., 1950, Cornell University. 237 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To determine the educational programs of a technical institute nature that should be added to the present programs of the Louisiana trade schools.

Source of Data: A State-wide survey was made covering 8 manufacturing and 8 nonmanufacturing industries including 275 establishments to determine number of technicians employed. The State was divided into six geographical areas and analyzed for distribution of technical occupations, vocational facilities lending themselves to technical education, and availability of students. Technical occupations were grouped in clusters to form technical curriculum groups.

Findings and Conclusions: The technical occupations in accounting, banking, construction, heat and power, mechanical, petroleum production are generally distributed throughout the State with no significant concentration. Occupations in industrial instruments and industrial laboratory are concentrated in three distinct areas. Petroleum production is concentrated in four areas. Graphic arts technical occupations are highly concentrated in one area. The study recommends two-year technical curricula, the number of students for whom provision should be made, and the areas in which the curricula should be offered.

1722. HARLOW, MAX B. *Curriculum Problems in Vocational Education for the Aircraft Industry.* M. A., Claremont Colleges, 1944. 130 p.

An analysis of the numerous occupations in the aircraft industry and suggested educational programs for these occupations.

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1723. HARPER, HERBERT DRUERY (Ph. D.) *The Development and Present Status of the Metal Trades and Their Training Programs with Special Reference to the Metropolitan Area.* New York University, 1934. 331 p.

An analysis of the educational needs in the metal industries. It includes an historical background of the metal industry and its relation to society, government, communications, industrial labor, and wages.

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1724. HAUER, NELSON A. *Comparative Analysis of Curriculum Patterns in the New York State Institutes of Applied Arts and Sciences.* Ph. D., 1949, Cornell University. 331 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To determine whether there was any particular design or patterning in the organization of the curricula of the New York State Institutes of Applied Arts and Sciences with respect to 10 factors.

Source of Data: Institute bulletins, pamphlets, and research studies were reviewed. Personal visits to several institutes and interviews with institute directors were made.

Findings and Conclusions: The following qualifications were stated: Vocational technical education should conform to the needs of people and the necessities of industry; provision for elective courses should be included in every curriculum; a curriculum properly conceived should provide for individual differences. On the basis of the above qualifications recommendations were made covering: Length of curricula, general and technical courses, elective or optional courses, classroom and laboratory periods, one-term courses, number of courses per curriculum, work-study load, and unit credits.

1725. HAWKINS, AUBREY ROBERT (M. S.). *A Proposed Plan For Teaching Industrial Arts Education in Rapids Parish.* Louisiana State University, 1941. 68 p.

A proposed plan for teaching industrial arts on an itinerant basis in five high schools in Rapids Parish, Louisiana. The cost of equipment for the proposed program is included.

1726. **HENRY, WILLIAM FRANKLIN.** *The Curriculum of Lenoir City High School in Relation to Community Needs.* M. S., 1952, University of Tennessee. 65 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the curricular changes which have occurred in the Lenoir City, Tennessee, High School over a period of ten years.

Source of Data: Data were obtained from a study of the graduates over a ten year period.

Findings and Conclusions: Sixty-seven per cent of the graduates terminated their formal education upon graduation from high school. The majority of the occupations of the parents and occupations available to youth in the community require little or no training beyond high school. This indicates a need for vocational-industrial classes and additional offerings in commercial subjects and distributive education.

1727. **HILL, JESSE O.** *The Turpentine Industry—A Study Pertinent to Industrial Institutions in the Secondary Schools.* M. A., 1950, University of Florida. 87 p. Library, University of Florida, Gainsville.

Purpose: To enrich the industrial arts program of Florida through introduction of one phase of the woods industry.

Source of Data: A study of the turpentine industry was made with a view of acquainting school youth with this important resource of Florida.

Findings and Conclusions: The study is presented on 82 kodachrome slides with suggestions for their use in the classroom. Included are a brief history of the industry, a résumé of research, and current trends.

1728. **HOLLEY, THOMAS L. (M. Ed.).** *A Vocational Training Program for Negroes in San Antonio, Texas.* Colorado Agriculutral and Mechanical College, 1947. 102 p.

A study of 948 students who withdrew or were graduated from the Wheatley High School from 1935 to 1939 to determine causes of withdrawals and modifications needed in courses. A curriculum revision is suggested to prepare Negro youth to enter industry or diversified occupations.

1729. **HOLT, ROBERT S.** *Teacher Training Needs in New Hampshire.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 56 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To compare the nature of industrial arts in general with the nature of industrial arts in New Hampshire, to compare the nature of teacher-training in this field in general with the nature of teacher-training for this field in New Hampshire, and to present a possible plan for providing teacher-training in industrial arts at Keene Teachers College in Keene, New Hampshire.

Source of Data: The nature of industrial arts in general was determined by referring to definitions by recognized authorities. The nature of industrial arts in New Hampshire was disclosed by the use of questionnaires. A curriculum was prepared by studying existing curricula in other training institutions.

Findings and Conclusions: A need exists for industrial arts in New Hampshire. The nature of industrial arts in secondary schools in New Hampshire compares favorably with that in other sections of the United States. The teacher training programs in New Hampshire did not cover industrial arts courses. Courses for the training of industrial arts teachers were suggested.

1730. **HUSS, WILLIAM E. (Masters).** *A Program of Studies Developed from the Metal-Manufacturing Industries.* Ohio State University, 1946.

1731. **INSALL, R. W. (M. S.).** *A Course of Study in Industrial Arts for the Orange Public Schools.* East Texas State Teachers College, 1943. 130 p.

A course of study in industrial arts compiled to meet the needs of a local community and the requirements of the state department of education. It compiles material to be used in teaching two years of shopwork in the junior high school on the laboratory of industries level, and woodwork, drawing, metalwork, auto mechanics, printing, and ship mathematics in the senior high school.

1732. **JACKSON, CARNEGIE A. (M. A.).** *Revising the Vocational Curriculum to Meet the Needs, Interests, and Opportunities of the Lincoln High School, Anadarko, Oklahoma.* Colorado State College of Education, 1944. 91 p.

A survey and evaluation of the Lincoln High School vocational program with recommendations to improve the curriculum to meet immediate employer needs.

1733. JACKSON, CLARK L. (Masters). *Industrial Arts in the Small High School: Proposal for Industrial Arts in the High School at Hilliards, Ohio.* Ohio State University, 1930.

1734. JAMISON, ROBERT EDWARD. *Relating School Experiences and Industrial Arts Needs in Winter Haven, Florida.* M. Ed., 1951, University of Florida. 107 p. Library, University of Florida, Gainesville.

Purpose: To demonstrate the value of industrial arts activities in a high school curriculum designed to meet pupil needs.

Source of Data: Data were secured from observation of students, student records and an analysis of industrial arts equipments.

Findings and Conclusions: Considerable growth in industrial arts offerings is predicted for the Winter Haven schools. An increase in industrial arts experiences for girls is anticipated and recommendations concerning plant and equipment are made.

1735. JOHNSON, PALMER O. (M. S.). *Practices and Needs in General Drawing—Traditional and Proposed Content.* The Stout Institute, 1941. 51 p.

An analysis of questionnaires sent to drawing teachers in Wisconsin to determine the content and scope of drawing curricula. Consideration is given to the objectives and texts of general drawing courses.

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1736. JORDAN, THOMAS F. (Ph. D.). *The Problem of Vocational Education and the Catholic Secondary School.* Catholic University of America, 1942 185 p.

By tracing the evolution of vocational education, examining the present concepts, and analyzing the needs of youth, the writer substantiates his recommendations for a curriculum for all secondary schools which will provide a fuller general education program.

1737. KELLEY, CECIL EVERETT. *A Study to Determine the Value of Elective Industrial Arts Courses in Harding Junior High School, Oklahoma City, Oklahoma.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 86 p. Graduate Office, Okahoma Agricultural and Mechanical College, Stillwater.

Purpose: To examine and evaluate the elective industrial arts courses in a junior high school.

Source of Data: Data were obtained through personal interviews, and a questionnaire.

Findings and Conclusions: It was concluded that the industrial arts program was supplying a knowledge of safety education in introduction to industry, consumer knowledge, aesthetic values, and vocational guidance.

1738. KELLEY, ROBERT R. *Limited Projects in Junior High School Industrial Arts.* M. A., 1953, Sam Houston State Teachers College. 58 p. Library, Sam Houston State Teachers College, Huntsville, Texas.

Purpose: To assemble information concerning the selection of junior high school projects that will challenge the abilities of the students.

Source of Data: Data were secured from handbooks, projects books, texts, and films.

Findings and Conclusions: Junior high school students need basic mechanical drawing in order to make and read plans for projects in their shop courses. Junior high schools can enrich their industrial arts offerings by including woodcarving and leatherwork in the curriculum.

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1739. KENT, RONALD W. (Doctors). *Practical Curriculum Revision for the Essex County Vocational Schools.* New York University, 1931.

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1740. KINKER, H. ROBERT. *An Automotive Curriculum for the State of Ohio.* Ed. D., 1949, New York University. 356 p. Library, New York University, New York, and Library of Congress.

Purpose: To develop an automotive curriculum basic to training in a vocation.

Source of Data: Survey of practices in 22 vocational schools in Ohio and 20 vocational schools outside of Ohio. All of the States in this country and Puerto Rico, Hawaii, and the District of Columbia through their State departments of education were requested to send their courses of study in Automobile Servicing and Repair for evaluation. All States responded but one. Standard flat rate and service manuals of Ford, Chevrolet and Plymouth were also used.

Findings and Conclusions: A complete curriculum in Automotive Servicing and Repair was formulated including such subjects as safe working practices, equipment and tools needed, materials needed, mathematics and science applications, blueprint reading and trade terms. Course was based upon a complete trade and job analysis. Various methods of trade analysis are explained and the author used a combination of them all.

1741. KOZACKA, J. S. (Masters). *Curricula in Technical High Schools.* University of Michigan, 1930.

1742. KURTH, EDWIN LOUIS. *A Curriculum in Aeronautics for the North Dakota State Normal and Industrial College.* M. Ed., 1949. Colorado Agricultural and Mechanical College. 60 p. Library, Colorado Agricultural and Mechanical College. Fort Collins.

Purpose: To develop a curriculum in aeronautics.

Source of Data: Questionnaire to high schools offering aeronautics, the State Department of Public Instruction and administrators.

Findings and Conclusions: The responsibility of the teachers' colleges in training teachers in the field is indicated. A proposed curriculum is set up.

1743. LACY, FREDERICK J. (Masters). *An Objective Curriculum in Industrial Arts Education for West Virginia State College.* University of Wisconsin, 1931.

1744. LAGISS, CHRIS. *The Teaching of Electronics in California High Schools.* M. A., 1949, Stanford University. 41 p. Cubberley Library, Stanford University, Palo Alto, California.

Purpose: To determine the extent to which secondary schools in California are preparing students to enter the field of electronics.

Source of Data: A personal letter with an appropriate questionnaire enclosed was sent to electronics instructors in thirty-two selected high schools requesting suggestions in initiating courses in electronics.

Findings and Conclusions: The field of electronics, due to inadequate textbooks, equipment, etc., is not receiving its proper place in the secondary schools of today. The student's high level of interest probably accounts for the success attained by the courses given. A greater emphasis on this field in our teacher training institutions, more and better books on the subject, further research, and greater acceptance of electronics as an established science course would do much to alleviate the present condition.

1745. LAMB, JACK JULIUS (Masters). *To Determine the Use Which Should be Made of Art Metal Work in the Junior High School as Indicated by the Seventh Grade of the Demonstration School, 1935–36, and by an Analysis of the Field.* North Texas State Teachers College, 1936.

1746. LANGEN, LARRY R. *A Suggested Course of Study for Eighth Grade Industrial Arts in Minnesota Schools.* M. A., University of Minnesota, 1948.

This is a suggested teaching guide for industrial arts in the eighth grade in Minnesota.

1747. LANHAM, ROBERT. *A Study of the Objectives and Trends of General Education and the Needs of the Sheet Metal Industries of Dallas, Texas in Order To Determine What Trends Should Be Taken for a Course of Sheet Metal Work at N. R. Crozier Technicial High School, Dallas, Texas.* M. S., 1950, North Texas State College. 49 p. Library, North Texas State College, Denton.

Purpose: To study the trends in the sheet metal industry and general education in order to keep the sheet metal shops abreast of the times.

Source of Data: Data used in this study were gathered from books, periodicals (*Industrial Education*), and interviews with employers of sheet metal industries. Also used was the bulletin, *N. R. Crozier Technical High School Handbook.*

Findings and Conclusions: General education tends toward the over-all development of the individual. Industrial Education is a necessary part of general education. Employers considered a general course in sheet metal of more value than teaching specific skills. The objectives of general education and desires of the employers both specified a course that would be general in nature.

1748. LEA, DONALD E. *Study of Industrial Arts Processes and Activities Which May be Integrated With Other Elementary School Subjects.* M. A., Kent State University, 1940. 92 p.

A study of industrial arts activities which may be integrated with other elementary school subjects.

1749. LISACK, JOHN P. *Development of Instructional Material for U. S. Air Force ROTC Cadets in Aircraft Maintenance Engineering.* M. A., 1949, Ohio State University. 31 p. Education Library, Ohio State University, Columbus.

Purpose: To study the development and to evaluate instructional material in aircraft maintenance enginering.

Source of Data: Content-derivation and methods were used to develop instruction material and related art work toward its final form as textual reference.

Findings and Conclusions: A course outline was developed reflecting the scope and objectives. A critical review and evaluation of relevant materials was made. New material was prepared. Technical content was illustrated. A format was developed.

1750. LUCHSINGER, LELAND B. *A Proposed Curriculum for Industrial Education in the Beaumont Independent School System.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 35 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To propose a well-rounded industrial education program for the Beaumont Independent School System based on present objectives of industrial education.

Source of Data: A survey of literature was made to ascertain the objectives of industrial education and general education. The Beaumont Independent School System was studied for the purpose of evaluating its offerings, tools, and equipment, and the proposed program was submitted to local leaders of labor and management as well as the school board, superintendent and principal.

Findings and Conclusions: The study revealed that in the Beaumont schools there exists a need for laboratory of industry courses, industrial arts general courses for the tenth grade, certain industrial arts unit courses, and some vocational trade and industrial courses.

1751. LUDINGTON, JOHN ROBERT (M. A.). *Industrial Arts Curriculum Construction in Secondary Schools.* Ohio State University, 1934. 143 p.

A comparative analysis, based on surveys and documents, of the approaches advocated by certain curriculum specialists in an effort to present conclusions regarding industrial arts curriculum construction.

1752. MANN, FRANK F. *A Study of the Status of a Core Curriculum Program with Respect to Junior High School Curricula.* M. S., The Stout Institute, 1940. 78 p.

An analysis of core curriculum programs for junior high schools.

1753. MARDIS, JOSEPH H. (Masters). *An Industrial Arts Program.* Ohio State University, 1938.

1754. MAXWELL, NEIL D. *Transportation as a Part of the Industrial Arts Program of Secondary Schools.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 100 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the value of transportation as a part of the industrial arts program of the secondary schools.

Source of Data: Data were obtained from questionnaires sent to 76 secondary schools in the United States.

Findings and Conclusions: A study of transportation can contribute to the objectives of general education, as well as to the objectives of industrial arts. Instructional activities should include: minor auto repair, building and flying model airplanes, overhauling gasoline engines, and building model ships and boats.

1755. MAY, CHARLES R. (Masters). *Program of Industrial Arts for a Junior-Senior High School.* University of Cincinnati, 1941.

1756. McBRIDE, WILLIS HOMER (Masters). *The High School Curriculum as Preparation for Vocational Education in College.* Oklahoma A & M College, 1933. 28 p.

1757. McCALL, DAVID L. *An Industrial Arts Transportation Program for Secondary Schools.* M. A., 1955, The Ohio State University. 92 p. Library, The Ohio State University, Columbus.

Purpose: To develop an industrial arts transportation program for secondary schools.

Source of Data: Data were obtained from previous research, programs now in operation, industrial museums, and aids from manufacturers and associations.

Findings and Conclusions: Only a few schools included elements of a transportation program. The most outstanding secondary school program was at Lincoln High School in Philadelphia. Two teachers colleges reported a program in transportation. A wide variety of teaching aids such as mock ups, models, films and slides, booklets and periodicals is available from manufacturers.

1758. **McHENRY, WILLIAM HOWARD (M. A.).** *An Industrial Arts Education Curriculum for East Carolina Teachers College.* George Peabody College, 1939. 98 p.

The preparation of a curriculum in industrial arts education for a designated area. The study includes the objectives, philosophy, scope, and content of industrial arts. Consideration is given to the selection, education, and certification of industrial arts teachers.

1759. **McKEE, JAMES H. C. (Masters).** *Construction of a Course of Study in Industrial Arts for Grade 7.* Washington University, St. Louis, Mo., 1945.

1760. **McKEEVER, KENNETH G.** *Industrial Arts for Elementary Schools of Kansas.* M. S., in Ind. Ed., 1950, Kansas State Teachers College. 113 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To suggest a course of study of industrial arts for the elementary schools of Kansas.

Source of Data: Data were collected by examining books, magazine articles, pamphlets, courses of study, and other literature and through personal interviews with leaders and teachers as well as observations in the elementary field.

Findings and Conclusions: The report sets up: Objectives; training and characteristics of the teacher for industrial arts on the elementary level; organization of classes and classroom procedures; and the industrial arts shop covering size, lighting, and physical equipment. Information is given on materials, where and how to purchase them, use of free materials, audio-visual aids. Projects were designed and constructed as models. These have been drawn up and photographed as a part of the report. Teachers' guides are supplied along with a list of suggested activities for each grade.

1761. **METCALF, J. M. (M. A.).** *Crafts Integrated in the Elementary Schools.* Colorado State College of Education, 1941. 132 p.

An investigation exploring the possibilities of integrating crafts with other elementary school subjects.

1762. **MICHEELS, WILLIAM J.** *Integration and the New Practices in Industrial Arts Education.* M. A., University of Minnesota, 1938. 83 p.

A study and evaluation of the trend toward integration of subject-matter fields, with particular emphasis on industrial education.

1763. **MONTIEL, ERNEST L.** *A Survey of Aircraft Plants in San Diego to Determine Instructional Units for the High School General Metal Shop Valuable to Students Entering the Aircraft Industry.* M. A., 1953, Chico State College. 73 p. Library, Chico State College, Chico, Calif.

Purpose: To ascertain the manipulative skills and information needed by workers in the aircraft industries in the San Diego area that could be included or emphasized in the general metals courses taught in the San Diego secondary schools.

Source of Data: Data were secured through questionnaires filled out by key foremen in four major aircraft industries.

Findings and Conclusions: The large number of instructional units in metalwork revealed by this study as important in the aircraft industry enlarges the possible scope of content for general metalwork in the San Diego area. The study also revealed a need for developing attitudes and work habits.

1764. **MOON, DOROTHY B.** *Texture Glazes.* M. Ed., 1953, Central Washington College of Education. 29 p. Library, Central Washington College of Education, Ellensburg.

Purpose: To test existing formulas, make adaptations from these, and conduct original experiments with the emphasis on a range of texture glazes.

Source of Data: Data were obtained from library research, interviews, and personal experience.

Findings and Conclusions: Most experiments produced a gunmetal metallic appearance which varied with the temperature and thickness of the glaze application.

1765. **MURRY, JESSIE L.** (Masters). *A Program in Industrial Arts for the Laboratory High School.* Ohio State University, 1944.

1766. **NAVE, JOHN THOMAS.** *Air Age Education in Industrial Arts as Adapted to the Transportation Area of the General Shop.* M. of I. A., 1953, North Carolina State College. 52 p. Library, North Carolina State College, Raleigh.

Purpose: To provide air age curriculum materials that would assist junior high school industrial arts teachers in teaching youth to live in an air age.

Source of Data: Data were secured from a survey of the forty eight states and a study of the Civil Aeronautic Administration Air Age Program.

Findings and Conclusions: Industrial arts can make a unique contribution to air age education by providing experiences and experiments through such activities as wind tunnel building and testing, and airport field trips.

1767. **NICHOLLS, JOHN W.** (Masters). *Industrial Arts and Farm Shop Programs: With Special Reference to Developments in Franklin County, Ohio.* Ohio State University, 1936.

1768. **OLIVO, C. THOMAS** (Masters). *Curriculum-Construction Techniques of Integrating, Coordinating and Developing Instructional Material for Vocational-Technical Education.* New York University, 1946.

1769. **PAIGE, THEODORE** (M. A.). *Determining a Course of Study for Industrial Arts in the Junior High School.* State University of Iowa, 1933. 107 p.

A proposed program and course of study for a junior high school in Iowa with an enrollment of from one hundred to two hundred students.

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1770. **PAINE, HARRY W.** *Revision of a Curriculum in a Vocational High School by Means of the Trade and Analysis Approach.* Ed. D., University of Michigan, 1943. 470 p.

This research covered a period from 1939 to 1943 and concerns the revision of a machine curriculum for a vocational high school as a part of the over-all curriculum revision work of the school. It outlines techniques and procedures followed to secure a valid analysis and workable, intercorrelating course outlines. The appendix of the dissertation presents the analysis, followed by shop and related subject course outlines, as well as sample instruction sheets of various types used to facilitate the teaching of the content suggested by the outlines.

1771. **PALMER, H. G.** (Masters). *A Study Based on the Basic Subject Matter Included in the Iowa Industrial Arts Courses.* Iowa State Teachers College, 1937.

1772. **PAOLUCCI, DANIEL J.** *An Appraisal of Mechanical Drawing Courses Offered at Oswego State Teachers College, Oswego, New York.* M. S. in Education, 1950, Cornell University. 93 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To determine whether the required mechanical drawing program in the industrial arts curriculum of a teacher training institution develops in each pupil a knowledge and understanding of mechanical drawing.

Source of Data: A questionnaire was sent to 112 students of the entering class to determine data on age, experience, and high school preparation of the students. Analysis was made of course descriptions from the school catalogue and from interviews of teachers of mechanical drawing.

Findings and Conclusions: It would seem important that recognition be directed to individual student needs, regarding previous background in mechanical drawing. The syllabus description for the introductory course is admirably designed to provide a sound fundamental background in the basic principles of the subject.

1773. **POUND, JACK K.** *Grade Placement of the Various Handcraft Courses in Five Major Schools in Texas.* M. Ed., 1949, Agricultural and Mechanical College of Texas. 41 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain the place of various handcraft courses in the curriculum.

Source of Data: A survey was made of five major schools in Texas offering handcrafts, and a study of materials and supplies was made by reviewing literature on the subject.

Findings and Conclusions: There is a trend toward handcraft in art courses in the elementary school from the kindergarten to the sixth grade. These activities included clay modeling, poster design, woodcraft, bookbinding, braiding, model air planes, block printing, and weaving. Handcrafts are extremely popular at the junior high school level. Handcrafts are a means of starting a pupil into a well rounded industrial arts program.

1774. PROCTOR, MILTON D. (Masters). ***Two-Year Terminal Curricula in the Coal Mining Industry.*** **New York University, 1932.**

1775. PUGLIESI, IGNATIUS. ***Collection and Use of Salvage Materials in Selected Industrial Arts Programs of Detroit Public Schools.*** **M. Ed., 1955, Wayne University. 46 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To ascertain to what extent industrial arts teachers made use of student contributed salvage materials, their opinions toward the different aspects of salvage programs, and the methods they used in handling these materials.

Source of Data: Data were gathered by personal interviews and by questionnaires from elementary and intermediate school shop teachers of the Detroit Public Schools who taught general industrial arts, household mechanics, woodshop, metalshop, or hobby shop.

Findings and Conclusions: Many of the aims of modern education are satisfied by programs of student contributed salvage materials. Some unfavorable factors must be overcome for efficient salvage programs. Most teachers are using some form of salvage program, and much is left to be desired in the methods of allowing credit for materials brought in by pupils.

1776. RADTKE, RAYMOND M. ***Curriculum Construction For Programs of Industrial and Technical Education for the Smaller Communities of New York State.*** **M. S. in Ed., 1948. Cornell University. 70 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: To acquaint secondary school administrators, and other interested community members with the kinds, organization and administration of industrial and technical education in New York State, and to provide a suggested guide or step-by-step procedure for using an adaptation of "Trade and Job Analysis" in industrial and technical curriculum construction.

Source of Data: Library research.

Findings and Conclusions: Material is described in three parts: Industrial and technical education in New York State—terminology, types, agencies, and regulations; curriculum construction in industrial education—defining the occupational area, analyzing the occupational area for payroll jobs, analyzing payroll jobs for tasks and operations, analyzing operations for steps and related information, organizing the material into teaching units, constructing courses of study, and evaluating the curriculum; and bibliography—selected and general references.

1777. RASMUSSEN, ALBERT MERRILL. ***Keep Them Flying—A Course in Aircraft Engines.*** **M. S. in Ed., 1949, University of Southern California. 123 p. Education Library, University of Southern California, Los Angeles.**

Purpose: To construct a course of study on the senior high school or junior college level, exploratory in nature.

Source of Data: An analysis of the various fundamental systems used in aircraft engines.

Findings and Conclusions: A course of study is developed on the basis of the various fundamental systems. Lesson sheets and photographs are included for each unit.

1778. RAY, JESSE E. (Masters). ***An Analysis of The Bricklaying Trade for Instructional Purposes.*** **Iowa State College, 1930.**

1779. REED, WALTER L. (Masters). ***A Study to Determine the Curriculum Changes Needed, if Any to Provide a Standard Vocational High School for the Waco State Home, Waco Texas.*** **North Texas State Teachers College, 1942.**

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1780. REED, WILLIAM T. (Ed. D.). ***A Partial Selection of Curriculum Content for the Improvement of Industrial Teacher Education in Colleges for Negroes.*** **University of Pittsburgh, 1947. 206 p.**

Many of the essentials necessary for optimum adjustment to and in occupational pursuits are not presented in textbooks and other instructional materials. Through a study of these shortages, the author presents an evaluated list of descriptive needs suitable for strengthening preparation in various areas of industrial pursuits.

1781. SCHUCK, ROBERT E. ***Color Dynamics: Its Implications For Industrial Arts Laboratories.*** **M. A., 1950, The Ohio State University. 221 p. Library, The Ohio State University, Columbus.**

Purpose: To show how color dynamics may be used in industrial arts laboratories.

Source of Data: Data were obtained from an extensive review of books, manufacturers literature, and case histories of the use of color in industry.

Findings and Conclusions: Evidence warrants the use of color in industrial arts laboratories. Proper lighting is essential to any color conditioning program. Light and color team up to make for ideal working and learning conditions.

1782. SMITH, GEORGE H. ***Tool Design and Its Place in the Field of Education With Special Reference to Certain Areas.*** **M. S. in Ed., 1950, Cornell University. 103 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: To study the training of persons for entrance into, or advancement within, an occupation concerned with the planning or design of cutting tools, jigs, fixtures, gages, dies, etc., which are considered necessary units essential for the operation of production machinery or the assembly of its products.

Source of Data: Limited survey of plants by personal interview, survey of inplant training programs, and job descriptions and specifications from Federal and State employment agencies were examined.

Findings and Conclusions: Formal college engineering training covering the uses of tool design is too brief to insure entrance into the field of tool designing except in those large industries which can afford to give additional training. Private schools teaching tool design usually have excellent industrial contacts. A third competitor of the engineering college program is that of the technical institute. There is a trend toward "levels" in tool design. These may permit easier admission to those coming from former unrecognized sources.

1783. SMITH, LESLIE L. ***Technical Training Instruction in the Theological Curriculum.*** **M. S., 1949, The Stout Institute. 55 p. Library, The Stout Institute, Menomonie, Wisconsin.**

Purpose: To determine the nature, scope, and frequency of technical problems confronting the minister.

Source of Data: A check list was prepared to obtain this information and a thorough coverage was made of the territory served by Emmanuel Missionary College.

Findings and Conclusions: Results of the study revealed an outstanding need for training ministers in technical fields. Courses should be adapted to meet specific needs of the minister and these courses should be selected according to their importance as disclosed by the study. Further study should be made to determine which trade within a vocational area should be offered as suitable technical training for ministers.

1784. SOTZIN, HERBERT A. (Masters), ***An Industrial Arts Curriculum for Grades 4 to 12, Inclusive.*** **University of Cincinnati, 1930.**

1785. STROUD, VADEN H. (M. S.). ***Pre-Engineering and Technical Service Curricula, Based on the Vocational Interest of High School Boy Students.*** **Colorado Agricultural & Mechanical College, 1940. 150 p.**

A survey of 300 Hutchinson Junior College students to determine the value of the standing program in pre-engineering and technical service curricula and to suggest modifications.

1786. TATE, JOHN B. ***An Analysis of Industrial Arts Education Curriculums in Fifty-One Selected Colleges and Universities in the United States.*** **M. S., 1949, Oklahoma Agricultural and Mechanical College. 101 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To analyze the curriculum requirements and offerings in the 51 selected colleges and universities, to find the problems that affect these requirements and offerings which tend to improve or hold back the development of an ideal curriculum, to develop an ideal curriculum for the preparation of junior high school and senior high school industrial arts teachers.

Source of Data: Catalogs were obtained from 160 colleges and universities. These catalogs were studied and 51 colleges were selected for the study. A questionnaire was sent to the heads of the industrial arts departments in the selected schools. Library research was used to obtain the history and philosophy in the thesis.

Findings and Conclusions: Considerable variation was found in the offerings and requirements in the industrial arts teacher education curriculums in the selected institutions. The information obtained from the catalog and questionnaire study was used to devise an ideal proposed curriculum for the preparation of teachers of industrial arts. Requirements of the proposed curriculum in industrial arts teacher education for a bachelor's degree is presented.

1787. VERNON, RALPH JACKSON. *A Proposed Wood Technology Curriculum for Technical Schools—Based on Current Literature.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 109 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain the need and the feasibility of a wood technology curriculum in areas where the wood products industry is a major part of the economy. To develop a wood technology curriculum based on current literature for technical schools. To identify and describe job clusters for which a trainee in wood technology would be qualified upon completion of the proposed curriculum. To list sources of information used in this study that might be of assistance in the development of a similar curriculum.

Source of Data: A review was made of literature concerning wood technology and curricula including such instruction. Job clusters in the wood products industries were identified through a study of related literature. A curriculum was prepared and submitted to the Educational Director of the Texas Forestry Service for evaluation.

Findings and Conclusions: A need for a wood technology curriculum exists in more schools than are now teaching wood technology. The findings of the study indicate that the proposed curriculum is feasible. Certain job clusters can be logically included in wood technology instruction in the technical school. A curriculum and a list of sources of information was prepared.

1788. VOLSTORFF, GLENN FRED. *A Curriculum Study in Industrial-Arts Metalwork.* M. S., 1952, Illinois State Normal University. 41 p. Library, Illinois State Normal University, Normal.

Purpose: To find an objective method of determining what metalwork equipment should be included in an industrial-arts program.

Source of Data: Data were secured by using the Sears, Roebuck and Company's general catalog as a basis for selecting the metalwork equipment used by the average consumer. The average, yearly sales figures for each metalwork item was used to rank the items as to number of sales. The items most frequently purchased were then considered to be those metalwork items which the average consumer is most likely to buy and use in everyday life and which, therefore, should be included in an industrial-arts program.

Findings and Conclusions: Certain items in the list of metalwork equipment should be included in an industrial-arts program and that emphasis should be given to each item on the basis of rank.

1789. WAGSTAFF, NEVILLE OWEN. *Relationship of Industrial Arts to the Home.* M. A., Kent State University, 1941. 65 p.

A study of the relationship between industrial arts and home life.

1790. WALLER, JOHN MILBURN. *A Proposed Course of Study for Everett High School Industrial Arts Department, Maryville, Tennessee.* M. S., 1951, University of Tennessee, Library, University of Tennessee, Knoxville.

Purpose: To develop a course of study for Everett High School, Maryville, Tenn.

Source of Data: Data were secured from records of Everett High School, the county superintendent of schools, and professional literature.

Findings and Conclusions: The course proposed includes objectives, informational and manipulative instruction units, necessary tools and equipment, suggested projects, suggested textbooks and references, and details as to supplies.

1791. WARNER, EDITH A. *An Outline For A Course of Study For Commercial Foods Shop.* M. Ed., 1954, University of Cincinnati. 47 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To outline and organize a course of study for the eleventh grade commercial foods shop at Central High School in Cincinnati, Ohio.

Source of Data: Data were obtained from the files of vocational educators, other course outlines, texts in foods, and general cookbooks.

Findings and Conclusions: The course outline is organized into seven areas of activities and related work, each area representing a general method of cookery.

1792. **WELBORN, JAMES DAVID** (Masters). *An Analysis of Factors Which Will Determine the Application of Design to Industrial Arts Projects.* North Texas State Teachers College, 1940.

1793. **WELLS, J. HASKIN** (Masters). *Practical Arts Course Content as Indicated by the Needs and Interests of Denton Junior High School Sixth Grade Boys.* North Texas State Teachers College, 1936. 92 p.

1794. **WRIGHT, HOMER H.** (M. S.). *A Study of the Industrial Arts Program of the Houston Schools.* A & M College of Texas, 1940. 156 p.

A description of the industrial arts program in the schools of Houston, Texas, in 1939–1940, with suggestions for curricular reorganization.

1795. **WYLIE, WILLIAM ALLEN, and CLYDE T. SKINNER** (M. S.). *Determination of a Technical Curriculum in a Comprehensive High School, with Special Reference to the Edwin Denby High School of Detroit, Michigan.* Wayne University, 1939. 131 p.

An analysis of the needs and interests of students to determine the need for the establishment of a technical curriculum for boys at the secondary school level.

1796. **ZACK, JOSEPH FRANK** (Masters). *A Program of Industrial Arts for the High School of Tuscarawas County.* Ohio State University, 1937.

1797. **ZIEMKE, DONALD PAUL.** *A Course of Study for the Second Year of Related Science in a Vocational High School with Recommended Teaching Aids.* M. S., 1950, University of Tennessee. 149 p. Library, University of Tennessee, Knoxville.

Purpose: To develop a course of study which includes more advanced and complex units of related science generally applicable to the all-day trade preparatory program in a vocational high school.

Source of Data: Data were obtained from an analysis of courses in related science for ten trades.

Findings and Conclusions: Sufficient topics to most trades were found to constitute a course of study suitable for a year of 36 weeks in related science. In addition to the course outline, suggestions for teaching, recommended apparatus, instruction sheets, and a list of free and inexpensive materials were developed.

Teaching Aids and Techniques

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1798. **ABRAMSON, BERNARD.** *A Comparison of Two Methods of Teaching.* Ph. D., 1950, New York University. 190 p. Library, New York University, New York.*

Purpose: To ascertain whether there are significant differences in gain and retention of knowledge resulting from using two methods of instruction.

Source of Data: Two groups were taught by different methods, one conventionally and one using pictoral ideographs. Data were secured through the use of standardized tests which were given to measure immediate gain in knowledge and again after two months and again after three months to measure retention.

Findings and Conclusions: The data offer evidence that pictoral media and discussion is a valid method of teaching mechanics. All significant gains in information were made by students using pictoral ideographs. For both groups the loss after two months was small. A much greater loss for both groups occurred after three months.

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1799. **ADAMS, JOHN VOSE** (Ed. D.). *Science Demonstration for the Industrial Arts Shops.* New York University, School of Education, 1947. 240 p.

An attempt to bring about desirable integration of science and industrial arts shop work by demonstrating science principles basic to shopwork. A compilation of shop processes validated by a jury of experts are included.

1800. ADAMS, ROBERT F. S. *A Comparison of the Effectiveness of Training Films and Teacher Demonstration as Supplementary Devices for Teaching Related Information in Industrial Arts Electricity.* M. A., 1953, San Diego State College. 70 p. Library, San Diego State College, San Diego, California.

Purpose: To ascertain the relative effectiveness of two types of training aids—the sound motion picture and the teacher-made "live" demonstration—when used as supplementary classroom devices, in the teaching of related and technical information in industrial arts electricity.

Source of Data: Data were obtained by planning the teaching methods employed in the three phases of the experiment so that each group of students would complete one phase with textbooks only, one phase with textbooks supplemented by teacher demonstration, and one phase with textbooks supplemented with training films. Assigned reading from the textbook was identical for all groups on any given day; the variation in methods was in the variable factor.

Findings and Conclusions: Result of the experiment were very close, with the film apparently comparable in effectiveness with the demonstration. Whenever possible, a mixture of the two media (films and demonstrations) should be used, and an informal evaluation should be conducted to determine their relative effectiveness in the particular situation. If a teacher has slow readers in his classes, the potentialities of the film should not be overlooked.

1801. AKERS, OLIVER BRUCE. *An Audio Visual Aid for Teaching the Internal Combustion Engine.* M. A., 1954, Chico State College. 48 p. Library, Chico State College, Chico, Calif.

Purpose: To construct and experiment with the classroom adaptability of an audio-visual aid for teaching internal combustion engine that would be a variation from the conventional cut-away engine for instructional purposes.

Source of Data: This audio visual aid was conceived, designed, and constructed by drawing upon fifteen years of study and experience as a skilled aircraft engine and automobile mechanic. This self-contained teaching aid consists of a six cylinder Plymouth engine mounted on a castored stand. Color is employed throughout to make it easy to trace the various systems or locate parts on or within the engine or accessories. Windows are cut at strategic spots to permit the students to observe the engine in operation.

Findings and Conclusions: The completed unit operated smoothly as a gasoline engine on the rear three cylinders. The unit in operation in a learning situation held the students' interest and attention and stimulated learning.

1802. AMRINE, HAROLD THOMAS (M. S.). *A Study of Skill in Manual Work.* State University of Iowa, 1939. 79 p.

A study to discover which therbligs are most affected in the acquisition of manual skill. Three operations were chosen for this study in the development of skill in manual work: (1) screwdriver study, (2) ironing and folding napkins, (3) ironing and folding handkerchiefs.

1803. ARNOLD, RAYMOND WESLEY (M. S.). *A Study of the Effectiveness of Motion Pictures in Teaching Industrial Arts in the Junior High School.* A & M College of Texas, 1932. 94 p.

An experimental study of the relative effectiveness of motion pictures as teaching aids in industrial arts. The study presents facts showing that motion pictures are effective teaching aids and outlines plans for their use.

1804. AVEY, WILLIAM COLON (M. A.). *An Experimental Comparison of the Process Model Method with the Operation Sheet Method of Teaching Beginning Seventh Grade Woodwork.* Southwest Texas State Teachers College, 1938. 112 p.

An experimental study of three-dimensional process models vs. operation sheets in teaching woodwork.

1805. BALTZ, HOWARD FOSTER. *Graphic Visual Aids to Instruction.* M. S. in Ind. Ed., Kansas State Teachers College, 1946. 107 p.

A study of methods of analyzing data for chart presentation, giving the physical characteristics of charts, methods of illustration, and methods of classifying charts. It suggests methods of integrating the use of charts, models, etc., with traditional methods of presentation, and the building of a teaching aids library.

1806. **BARTEL, CARL RAY.** *Chalkboard Illustrations, An Industrial Education Teaching Aid.* M. S., 1952, Kansas State Teachers College. 136 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To show the possibilities of the ordinary chalkboard as the number one visual aid in the classroom.

Source of Data: Data were obtained from a study of the various types and kinds of sketching and illustration used historically and at the present, from chalkboard, chalk and sketching materials catalogs, and writing on various uses of the blackboard.

Findings and Conclusions: Thirty-two different ways of using the chalkboard illustrated and discussed.

1807. **BASS, MALLEY R.** *Teaching Aids in Industrial Arts.* M. A., 1952, Sam Houston State Teachers College. 76 p. Library, Sam Houston State Teachers College, Huntsville, Tex.

Purpose: To describe teaching aids in industrial arts and show the value and use of them.

Source of Data: Data were obtained from books, professional magazines, and research studies.

Findings and Conclusions: Teaching aids are of value in teaching industrial arts because they speed up the learning process and make learning more interesting.

1808. **BELL, ROBERT L.** *Visual Education in Industrial Arts.* M. A., 1949, University of Minnesota. 111 p. Department of Industrial Education, University of Minneapolis, Minn.

Purpose: To report the purposes, practices, devices and values of visual aids with particular reference to industrial arts as a curriculum area.

Source of Data: Canvass of literature, simple experimentation and evaluation with two groups of students; one briefed before the film and one without previous information.

Findings and Conclusions: Preparation stimulates learning and has significant effect. Visual aids should have a direct relation and adaptation to the teaching situation if properly used.

1809. **BIRD, ROY E. (Masters).** *To Determine Methods of Planning More Effectively with Students in Shop Work.* North Texas State Teachers College, 1941.

1810. **BIRKELAND, BIRDEEN (M.A.).** *Related Materials in Mechanical Drawing—A Classroom Study Involving Comparison of the Text and Lecture Technique of Presentation.* University of Minnesota, 1934. 90 p.

A comparison of the methods of oral and printed presentation of related information in ninth grade mechanical drawing to determine the more effective method. Data were gathered in Minneapolis drawing classes in 1933–34.

1811. **BLOEM, GERALD W.** *A Study in the Technique of Teaching Ninth Grade Woodwork as the Core of Instruction.* M. A., 1950, University of Michigan. 110 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To chart, outline and discuss a plan for training pupils in which the work of the shop may be used as a core subject.

Source of Data: Following a discussion of the concept of a core curriculum in secondary schools and using the information in conjunction with job-analysis, a course of study with woodwork as the core, showing its relationship to other high school subjects through the use of 3 selected projects was made.

Findings and Conclusions: The teaching of woodwork was found to use data and material from the fields of: English, history, mathematics, general science, botany, biology, art, bookkeeping, economics, commerce, civics, geography and manufacture. The core teacher must work in cooperation with teachers in other subjects to get the maximum benefit from the total program. The purpose of the core is to insure the achievement of cultivated, integrated and individualized personalities for pupils, teachers and parents as well. The interest of all concerned must be the primary factor so as to project the core-study outside of the shop and school into the world of living and doing. Civic and business agencies can cooperate in making the program a successful one.

1812. **BOGGESS, JACK CLIFFORD (M. S.).** *A Contract Plan for Woodworking Instruction at the Ninth Grade Level.* Oregon State College, 1947. 122 p.

A study of the aims and course content of woodworking programs at the ninth grade level. It presents a one year course organized on the contract plan. Projects, scoring tables, tests, and study guides are included for each contract.

1813. BOHN, RALPH CARL. *Advanced Domestic Refrigeration Serving for the Technical High School.* M. Ed., *Domestic Refrigeration Servicing for* 1954, Wayne University. 70 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To gather, integrate, and present, in an educational manner, the modern service techniques utilized by the domestic refrigeration industry.

Source of Data: Data were obtained from a review of the literature, primarily journals.

Findings and Conclusions: The report is in the form of lesson sheets designed as teaching aids. These aids include justification for the topic, schematic drawings, explanations, reference study and topic examinations containing objective and subjective questions.

1814. BOLLES, ROY EARLE. *Visual Aids in the Teaching of Drafting.* M. A. in Ed., University of Michigan, 1946. 132 p.

A description of visual aids which can be used effectively by drafting teachers to motivate the work and to increase understanding.

1815. BOLMAN, JAMES (Masters). *A Method of Teaching Certain Industrial Arts in Junior High School and a Practical Working Course of Study.* University of Washington, 1932. 190 p.

1816. BOLSTAD, ARTHUR (Masters). *Procedure Used in Teaching Mechanical Drawing.* University of Southern California, 1932.

1817. BRENNER, LOUIS E. (Masters). *A Study of Motion Picture Films Available for Use in Connection with Industrial Arts Courses.* University of Pennsylvania, c. 1935–47.

1818. BRIGGS, CECIL LEE. *The Development of Teaching Aids for Elementary Electricity.* M. S., 1953, North Texas State College. 126 p. Library, North Texas State College, Denton.

Purpose: To develop instructional aids for use in teaching elementary electricity and to determine their effectiveness.

Source of Data: Data were obtained from literature and suggestions from teachers of electricity.

Findings and Conclusions: Thirty-six aids were developed that are not available through commercial sources, and these proved to be highly satisfactory.

1819. BRYANT, DONALD CLARKE (M. S.). *Effectiveness of Information Sheets and the Lecture-Discussion Method of Teaching Related Information to Junior High School Woodworking Classes.* Iowa State College, 1936. 96 p.

A comparison of the information sheet and lecture-discussion methods for presenting related information to junior high school woodworking classes. Suggestions for improvement are offered.

1820. BUCKMAN, CARL J. (M. A.). *Teaching Methods in Mechanical Drawing.* University of Minnesota, 1934. 118 p.

An experimental study, conducted during the first semester of 1933–34, of twenty-two matched pairs of 10–B students at South High School, Minneapolis. Model and blueprint methods of instruction were compared.

1821. BULLEN, BENJAMIN TALMADGE (M. A.). *A Comparison of Outcomes of Two Types of Teaching in Shop Work.* University of Denver, 1933. 65 p.

A report on an experiment of two types of teaching of shop work.

1822. BURNHAM, FRANCIS HARVEY. *Effectiveness of Projected and Oral Explanations When Using the Opaque Projector for a Ninth Grade Magnetism Unit.* M. S., 1952, Iowa State College. 49 p. Library, Iowa State College, Ames.

Purpose: To compare the effectiveness of presenting supplementary information by visual projection with oral presentation and use of the opaque projector.

Source of Data: Forty boys taking a beginning course in electricity in Decorah, Iowa, were used for the study. A final test was given to both groups at the close of the course and a re-test was given five weeks later. The analysis of covariance was used to test the significance of the differences between the two groups.

Findings and Conclusions: When an immediate test was used, the visual presentation was more effective than the oral presentation. No advantage could be shown on a re-test after a five-week interval.

1823. CAMPBELL, HAROLD JOHN. A *Comparison of Learning From Written and Oral Instructions In The Field of Industrial Arts.* M. S., 1954, Kansas State Teachers College. 58 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To compare oral and written presentations of information units in a ninth grade industrial arts course.

Source of Data: Data were obtained from an experimental study of the problems, using two forms of presentation with comparison of test scores.

Findings and Conclusions: The group that read the information gained more points in four of the units, while the group where oral presentation was made gained more points in five of the units. Oral presentation is most effective for students who have reading difficulties.

1824. CAMPBELL, ROBERT A. (Masters). *A Bulletin for Teachers of Industrial Arts.* Rutgers University, 1934.

1825. CANNON, ROBERT ALLEN. *Charts, Posters and Other Printed Material Used for all Displays in Industrial Arts Teaching.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 71 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To present the importance of visual aids, sources of supply, and available types of visual aids.

Source of Data: Library books were used in pursuing the general plan of the study. Charts and posters were obtained from manufacturers.

Findings and Conclusions: Verbal description needs to be supplemented by diagrammatic representation. Visual materials were rated on the following basis: Its value for direct student instruction and to the teacher. Other factors considered in the ratings were: Amount of advertising; interesting pictures or drawings; adequate easily read and well written information; and its availability at reasonable costs.

1826. CLEARY, STEPHEN F. (Masters). *An Analysis of Mechanical Drawing for Standardization and Teaching Purposes.* Cornell University, 1930.

1827. COCHRANE, ROBERT ERNEST. *Effects of Substituting Sound Motion Pictures for Laboratory Practice Upon Achievement in High School Mechanical Drawing.* M. S., 1949, Iowa State College. 34 p. Library, Iowa State College, Ames.

Purpose: To determine the effects of substituting sound motion pictures for laboratory practice upon achievement in high school mechanical drawing classes.

Source of Data: Students in 3 classes in the tenth grade mechanical drawing class at Maine Township High School were taught 3 units in mechanical drawing, namley, dimensioning, sectioning, and auxiliary views. One class was the control group while the other two classes were the experimental group. Each class was the control group for one unit of experiment. The experiment in its entirety lasted approximately 3 months.

Findings and Conclusions: From the evidence in this study using the methods described, and the units in drawing taught as they were, the hypothesis cannot be rejected that equal effectiveness results from substituting sound motion pictures for laboratory practice.

1828. COCKING, FLOYD W. (Masters). *The Use of Moving Pictures as a Means of Instruction in Introductory Mechanical Drawing.* University of Southern California, 1932.

1829. CORNWELL, RAYMOND L. *An Evaluation of an Audio-Visual Course.* M. S., 1952, Stout State College. 100 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To improve instruction in audio-visual education at Stout State College, and to learn the responsibilities of recent graduates for audio-visual programs.

Source of Data: Data were obtained from a follow-up check list sent to teachers now in the profession who had completed the audio-visual course during the required interval.

Findings and Conclusions: The introductory course in audio-visual education at Stout is giving training in the primary areas suggested by authorities and textbooks. The graduates now in teaching situations are finding the instruction they received practical and useful. Additional emphasis was suggested for instruction in the following items: construction of bulletin board displays, preparation of school exhibits, and techniques of poster and chart construction.

1830. CRAMER, LAURENCE RALPH. *Audio-Visual Aids in Industrial Arts.* M. A., 1953, The Ohio State University. 86 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the reasons for lack of interest by some teachers of industrial arts in audio-visual aids.

Source of Data: Data were obtained from a questionnaire sent to all industrial arts teachers in grades seven, eight, and nine of the Cincinnati Public Schools.

Findings and Conclusions: An interest in audio-visual aids was expressed by a small group of teachers. The physical equipment, projectors, screens, and room facilities, for audio-visual aids in the junior high schools of Cincinnati were inadequate, although the Visual Aids Exchange which handles motion picture films, slide, film strips, recordings, and various other devices was very complete.

1831. CRAWFORD, JOHN EDMUND (M. A.) *Effect of Visual Aids, Additional to Text, on Learning in Technical Electricity Theory.* University of Pittsburgh, 1934. 142 p.

A study of the effect of visual aids, used in addition to text aids, on learning. The period studied includes the years 1931 to 1934.

1832. CRENSHAW, CLIFTON W. *An Analysis of Time and Operations Involved in Vocational Cabinet Making in Jones County Junior College, Ellisville, Miss.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 34 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To analyze the time and operations used in vocational cabinetmaking as taught at Jones County Junior College, Ellisville, Miss.

Source of Data: A survey was made of literature concerning time and operation studies related to cabinetmaking and projects were analyzed to identify and study operations. Time records were kept on operations over a two-year period and the findings were analyzed by a time and motion study instructor.

Findings and Conclusions: From a time and operation chart prepared from accumulated records, minimum, average, and maximum times required on the various operations were obtained. The variations in the minimum and maximum time required in performing the operations on different projects were observed. It was suggested that this data would be of value in monthly reports required by the Veterans Administration.

1833. CRICHTON, W. S. *A Job Analysis Plan of Teaching Presswork at South High School.* University of Omaha, 1930.

1834. CUBA, LAWRENCE. *Twenty-One Teaching Aids for Woodworking.* M. A., 1952, University of Minnesota. 51 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To present successful teaching aids in the field of woodworking that included enlarged models, simplified models, abstract models, actual models, and displays.

Source of Data: Data were obtained from literature in the field and from experience in the shop.

Findings and Conclusions: The twenty-one teaching aids had been developed and proved successful in actual teaching situations. Each device was described as to construction and use and illustrated by a full page photograph.

1835. CUNNINGHAM, F. M. (M. S.) *Common Errors in Elementary Woodshop Technique.* Iowa State College, 1932. 64 p.

A study of the errors in technique made by pupils observed at work in hand woodworking classes. An outline of technique for tool operations is included based on the observations and recorded errors.

1836. CURRAN, FRED L. (M. A.) *The Demonstration Method Versus the Instruction Sheet Method of Teaching Industrial Arts.* University of Minnesota, 1934. 155 p.

An experimental study of the comparative values of the demonstration method and the instruction sheet method of teaching industrial arts, based on a study of fifth and sixth grade students in the practice teaching department of The Stout Institute, Menomonie, Wisconsin.

1837. DART, CLAYTON KENNETH (M. S.). *A Practical Approach to Drawing in Secondary Schools.* Oregon State College, 1941. 91 p.

A statistical report based upon replies of students, laymen, and educators regarding the necessity and desired outcome of the studies of drawing in the secondary schools of Eugene, Oregon.

1838. **DAVIES, ALFRED E.** *Common Mathematical Elements in the Various Trades.* M. S. in Ed., Cornell University, 1948. 107 p.

Ten trades were studied. The frequency of common elements was found to be in the following order: concepts, processes, mensuration, and space relations.

1839. **DAVIS, MARION RAYMOND (M. S.).** *Visual Teaching Aids for Hand-Tool Processes in Woodworking.* Oregon State College, 1940. 115 p.

Presents a plan in which the various visual materials could be utilized to enrich and parallel the hand-tool processes found in woodworking learning units. The application and use of the visual aid materials are described.

1840. **DICKMAN, HILMER CHRISTAN (M. A.).** *Experiment in Two Methods of Industrial Teaching: To Compare the Results of "Self-directed" Study with the Results of "Teacher-directed" Study in Solving Mechanical Assembly Problems.* Ohio State University, 1932. 52 p.

An experiment to determine the merit of two radically different methods of industrial arts teaching. The experiment was carried on between two groups of junior high students with the experiment repeated six times.

1841. **DIGBY, EDWIN E. (Masters).** *A Comparative Study of Two Methods of Teaching Mechanical Drawing.* Ohio State University, 1933.

1842. **DOUGHERTY, DORA J.** *The Use of Primary Contact Flight Trainers: A Comparison of Two Methods of Pre-Flight Instruction.* Ph. D., 1955, New York University. 165 p. Library, New York University, New York.

Purpose: To ascertain the usefulness of a mass instruction technique in reducing the amount of individual instruction necessary during primary flight training, to test the predictive quality of a mechanical comprehension test in measuring student success, and to compare the performance records of men and women.

Source of Data: The data were obtained by direct observation of performance of the subjects during the learning of assigned tasks. Four measures of performance were recorded: ability to complete task to a standard level of performance; number of trials needed to complete task; number of errors made; and time needed to learn task. A C–3 Link Trainer, converted to a contact trainer with a cyclorama, was the equipment used during the study. A 3 x 3 x 2 factorial design was utilized in this research and the data were examined statistically by the "F" and "t" tests.

Findings and Conclusions: For the maneuvers tested in this study a very real savings in individual instruction time may be realized by utilizing a mass instruction technique. The test of mechanical comprehension displayed no predictive ability in indicating those students who would be fast or slow learners on the tasks selected for study. There is no difference in the ability of men and women in performing and learning the tasks selected for this study.

1843. **DRINKALL, LEON R. (M. S.).** *The Analytical Method Versus the Traditional Method of Teaching the Electrical Theory of Direct Current Motors in Dunwoody Institute.* Colorado Agricultural & Mechanical College, 1941. 252 p.

A research study covering a four-year period and recording the results of ten selected sections of electrical students. The traditional and analytical methods of teaching and testing are analyzed.

1844. **DUCKER, BERNARD DALE.** *Methods and Devices for Teaching Industrial Arts Bench Woodwork in Colorado.* M. A., 1951, Colorado Agricultural and Mechanical College. 87 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To arrive at the best methods and devices for teaching bench woodwork in Colorado.

Source of Data: Data were obtained from questionnaires sent to 108 industrial arts teachers of Colorado. Analysis of opinions was made as to the best methods and devices for teaching bench woodwork.

Findings and Conclusions: Although all methods and devices suggested in the literature were used, the demonstration was the only method used by all teachers.

1845. DUNBAR, KENNETH G. ***Panel Board Aids for Teaching Industrial Arts to the Mentally Retarded.*** **M. A., 1955, Chico State College. 54 p. Library, Chico State College, Chico, Calif.**

Purpose: To plan and construct a series of panel board teaching aids showing step-by-step procedure for constructing a series of projects using varied media suitable for mentally retarded students.

Source of Data: Data were secured from books and other publications dealing with visual aids and mentally retarded children.

Findings and Conclusions: The panel boards presented and described have been used in classes for mentally retarded students and have proved to be helpful both to the students and the instructor.

1846. ELKINS, CLAUDE CLAYBOURNE ***Jr. Television and Its Application to Education with Special Emphasis on Industrial Arts.*** **M. S., 1954, North Texas State College. 99 p. Library, North Texas State College, Denton.**

Purpose: To ascertain the practicability of using television as a medium of instruction in programs of education with special emphasis on industrial arts.

Source of Data: Data were secured from literature in the fields of education and television, and interviews with persons employed in television broadcasting.

Findings and Conclusions: Television as a medium of instruction is compatible with the accepted objectives of education and with the accepted theories of learning. The cost of producing a program to be televised for educational purposes is unusually high, and at this time it does not appear to be practical from an educational point of view.

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1847. ELLIOTT, CHARLES ARTHUR. ***Audio-Visual Materials Used In Industrial Education In The Secondary Schools Of Illinois.*** **Ed. D., 1953, University of Missouri. 135 p. Library, University of Missouri, Columbia.***

Purpose: To ascertain the use and value of audio-visual materials and the administration thereof in industrial education in the secondary schools of Illinois; to interpret from authoritative sources the accepted practices in the use and administration of audio-visual materials and to ascertain the extent to which industrial education instructors are following these accepted practices; and to determine the implications, if any, of the above for teacher training programs.

Source of Data: Data on the use and value of audio-visual materials and the administration thereof were obtained from information blanks completed by 431 respondents representing 261 schools. Data on accepted practices were taken from authoritative writings in texts, handbooks, research reports, bulletins, brochures, organizational publications, and current periodical literature. A comparison was made of the findings and accepted practices.

Findings and Conclusions: Audio-visual materials were being used to varying degrees in industrial education programs. A majority of the materials were considered of value and highly desirable for use in industrial education. Few facilities seem adequate for extensive use of these media. The accepted practices in the use and administration of audio-visual materials have been followed in most cases. To obtain satisfactory and extensive use of audio-visual materials, an organized and guided program must be established and maintained. Sufficient emphasis has not been given to training industrial education instructors in both pre-service and in-service training programs in the preparation, use, and administration of audio-visual materials.

1848. ERWIN, W. A. ***A Study of the Types of Audio-Visual Aids and the Extent of Their Use in the Industrial Arts Program in the Junior High Schools of Texas to Formulate a Program for Audio-Visual Aids Based on Skills, Training, and Attitudes of Teachers in Service and Professional Literature.*** **M. S., 1949, North Texas State College. 76 p. Library, North Texas State College, Denton.**

Purpose: To determine types, uses and teacher evaluation of audio-visual aids in teaching industrial arts in Texas junior high schools, recognized needs for additional aids, and the need for teacher-instruction in the use of audio-visual aids.

Source of Data: Questionnaires were sent to industrial arts teachers in Texas junior high schools to measure the extent of use, evaluation by teachers of various audio-visual aids, and to get opinions concerning aids and teacher instruction needed. A survey of published opinions of professional men and women was made.

Findings and Conclusions: Professional men and women believe that audio-visual aids could be used much more effectively for teaching industrial arts than is being done at present. This inadequacy of use seems to be due to lack of teacher training and leadership in audio-visual use. It was recommended that leadership and in-service teacher training in audio-visual use be stressed in all Texas junior high schools teaching industrial arts.

1849. FERGUSON, CHARLES C. *To Determine the Effect That a Course in Design Has on Skill in Judging Structural and Decorative Design.* **M. S., North Texas State College, 1940, 268 p.**

A descriptive study showing the effect that a course in design has on the skill of individuals in judging decorative design.

1850. FESSENDER, FRANK (M. S.). *A Study of the Methodology of Printing Education.* **Indiana State Teachers College, 1940. 206 p.**

A description of the development of printing as a school shop subject. By an analysis of available literature an attempt is made to determine the most satisfactory method of teaching printing. Such related topics as discipline, motivation, and interest are included.

1851. FIGLEY, HAROLD H. (Masters). *An evaluation of the Methods for Teaching Related Information in Industrial Arts.* **Ohio University, 1937.**

1852. FOREMAN, GEORGE C. (M. S.). *The Use of Still and Motion Pictures in Industrial Arts Classes.* **Oklahoma A & M College, 1941. 112 p.**

A study of still and motion pictures in industrial arts classes, with lists of films and companies furnishing films, and suggestions for their use.

1853. FOREMAN, HENRY E. (M. A.). *Visual-Sensory Aids in Industrial Arts Used in the Secondary Schools of Kansas.* **Colorado State College of Education, 1942. 167 p.**

A survey of industrial arts teachers to determine problems and uses of visual-sensory aids in Kansas secondary schools.

1854. FRANCE, FRANK LLOYD (M. S.). *A Contract Plan of Instruction for Junior High School Industrial Arts Classes.* **Oregon State College, 1937. 207 p.**

A study of the reasons for using contracts. Examples of contracts are included.

1855. GADBAW, W. E. (M. S.). *The Comparative Effectiveness of the Oral Group and the Instruction Sheet Method of Teaching Eighth Grade Metalwork.* **The Stout Institute, 1941. 109 p.**

A classroom experiment with eighth grade metalwork students at Hawthorne Junior High School, Wauwautosa, Wisconsin, second semester 1937–38, to compare the results of teaching by the oral method and the instruction sheet method.

1856. GALLEY, CYRUS ABEL *Sr. Effectiveness of Teaching Basic Elements of Industrial Arts as an Introductory Seventh Grade Course.* **M. S., 1950, Iowa State College. 51 p. Library, Iowa State College, Ames.**

Purpose: To ascertain the advantage in teaching a seventh grade introductory unit in industrial arts as compared to an exploratory course in which no introductory unit is included.

Source of Data: Data were obtained from testing students from two junior high schools in Moline, Illinois. A pre-test was given and then repeated at the end of the school year.

Findings and Conclusions: The greatest changes in preference were found in the experimental group. The same was true in achievement as measured by the test.

1857. GELLER, RUTH L. (M. Ed.). *A Course of Study for Bilingual Ninth Grade Girls Attending Vocational School in Buffalo, New York.* **University of Buffalo, 1941. 122 p.**

A study of the special problems involved in teaching English to pupils who come from homes where Polish is spoken. Data were taken from six parochial and several public schools.

1858. GERNETZKY, CARL F. (M. S.). *A Study of the Suitability of Printing Inks to Printing Paper.* **The Stout Institute, 1937. 49 p.**

The writer interviewed representatives of six different ink manufacturing companies and conducted experiments to determine the suitability of certain printing inks to use on various papers. The results serve as a guide for printing teachers in the selection of the proper ink and paper.

1859. GOFF, ROBY D. (M. S.). *The Teaching of Elementary Forging by the Contract Method.* Oregon State College, 1933. 175 p.

A program of instruction by means of a series of progressive contracts, based upon an analysis of forging and welding (ornamental iron work). These teaching methods are compared with those of the traditional methods of instruction.

1860. GOULD, THEODORE N. *Selected Audio-Visual Materials Which May Facilitate the Learning Activities in an Eighth Grade General Shop Class.* M. S., 1954, Kansas State Teachers College. 97 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To examine motion pictures and film strips for selecting and listing those suitable for teaching in an eighth grade general shop class.

Source of Data: Data were obtained from books, catalogs, and lists of audio-visual materials.

Findings and Conclusions: The report contains a listing of motion pictures and film strips in electricity, leatherwork, metalwork, plastics, woodwork, sketching and drawing, safety and first-aid, and occupational information.

1861. GRANGER, HERMAN RUSSELL. *The Production and Use of Teaching Materials for the Overhead Projector in the Industrial Arts Shop.* M. S., 1954, Kansas State Teachers College. 72 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To analyze the possibilities of the overhead projector as a visual aid in the industrial arts shop.

Source of Data: Data were obtained from literature, and laboratory development of illustrative materials.

Findings and Conclusions: The overhead projector is particularly effective for such materials as cellophane and plastic sheets, overlays, vu-graph films, animated devices, lantern slides and film strips.

1862. GUNDERSON, HOWARD B. (Masters). *Experimental Determination of the Effectiveness of Demonstration in Woodwork in Terms of Problem Solving.* University of Wisconsin, 1931.

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1863. GUNTHER, THERESA CHARLOTTE (Ph. D.). *The Manipulative Participation in the Study of Elementary Industrial Arts.* Columbia University, 1931. 438 p.

Compares the value of the conventional method of studying the facts from books with the manipulative participation method. It includes pupils studying industrial arts in the elementary grades. Two units of subject matter were studied in each of thirteen classes, selected from grades three to six.

1864. HACKWORTH, W. H. (M. S.). *Self-Motivated Shop Classes Versus Traditional Classes.* Colorado Agricultural & Mechanical College, 1939. 119 p.

A plan to determine whether civic and vocational efficiency of pupils who have a maximum intelligence quotient of ninety are given a better opportunity to develop in a self-motivated class or in an academic class where traditional methods are used.

1865. HAFFNER, LOUIS D. (M. Ed). *A Plan of Instruction to Promote Individual Achievement in Junior High School Bench Woodwork.* Colorado Agricultural & Mechanical College, 1943. 172 p.

An illustrated course of study in junior high school bench woodwork. Individual achievement is promoted.

1866. HAHN, BRUCE JACKSON (M. S.). *A Suggested Plan for Visual Education in the Corvallis Public Schools.* Oregon State College, 1941. 54 p.

A study including teacher evaluation of visual aid forms, extent and present use of visual aids, future needs and a projected long-term plan for schools of this community, and organization and operation of a "visual aids committee" as an interim device pending the establishment of a central department.

1867. HAHN, PAUL DAVIDSON (Masters). *Motivation of Printing in the District of Columbia Public Schools.* George Washington University, 1938.

1868. HAMLIN, JACK. *Effectiveness of Two-hour and Three-hour Laboratory Periods in the Teaching of Descriptive Geometry.* M. S., 1951, Iowa State College. 39 p. Library, Iowa State College, Ames.

Purpose: To ascertain the relative effectiveness of two hour versus three hour class periods in teaching descriptive geometry to freshmen engineering students.

Source of Data: Data for equating the groups were secured from the files of the Division of Engineering. The students were separated; one group having 4 two-hour laboratory periods and one hour lecture, the other having 3 three-hour periods. Both groups took the same final. Analysis of covariance was used to test significance of differences.

Findings and Conclusions: The skill exam showed a significant advantage for the four two-hour classes over the three three-hour classes. The theory exam showed no advantage for either group.

1869. HARTMANN, ERNEST FRANCIS. *Effectiveness of Audio-Visual Aids in Vocational Machine Shop.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 139 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the relationship between audio-visual teaching techniques and student achievement in vocational machine shop classes.

Source of Data: Data were obtained from a review of literature, and a statistical analysis of a control group and an experimental group in the Compton Junior College machine shop.

Findings and Conclusions: When the groups were equated on the basis of intelligence, mechanical aptitude, and mechanical drawing, the achievement of the experimental group exceeded that of the control group by 42.38.

1870. HAYDEN, ROYAL C. (M. S.). *Comparative Effectiveness of Silent Motion Pictures and Lecture Methods of Teaching Industrial Arts Students.* Iowa State College, 1936. 152 p.

An investigation of the comparative effectiveness of the motion picture and lecture method of teachinig industrial arts.

1871. HAYES, HUGH FORD. *Vitalizing Individual Instruction for Trade and Industrial Students.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 45 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To assemble improved techniques for vitalizing individual instruction in trade and industrial education.

Source of data: Data were obtained from a review of text and reference material on teaching aids and techniques, and experiences of the writer with visual aids and other instructional materials in the Natchitoches Trade School.

Findings and Conclusions: The principle of self-activity on the part of the student is of primary importance. The instructor is to stimulate, guide, help and encourage students through the most effective media. An instructor should appeal to as many of the senses as possible.

1872. HILL, HAROLD CHRISTIAN. *Descriptions and Directions for the Use of Selected Teaching Aids in Printing.* M. Ed., 1948, Wayne University. 39 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the need for instructional aids in the print shop and to present methods for constructing and using teaching aids.

Source of data: Data were obtained from books and periodicals.

Findings and conclusions: A number of teaching aids with directions for their use were developed.

1873. HODGES, GIFFORD L. (Masters). *Learning Units for a Junior High School Laboratory of Industries in Texas.* Sam Houston State Teachers College, 1941.

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1874. HORBAKE, R. LEE (Ph. D.): *Industrial Arts in the Elementary School.* Ohio State University, 1942. 351 p.

An experimental approach to determine the teaching-learning possibilities of industrial arts at the elementary school level. Evaluation devices were developed and used to aid in the instruction and to provide a degree of appraisal.

1875. HORNER, PHIL A. (M. S.). *Visual Instruction Supplementary to Industrial Education.* Oregon State College, 1937. 90 p.

A survey of visual instruction methods and techniques employed by industries and schools. It includes an evaluation of their usefulness to industrial arts teachers. Suggestions are made for increasing the effectiveness of teaching through the use of visual aids.

1876. HOWARD, ROY E. (M. Ed.). ***Developing Habits of Planning Orderly and Methodical Procedures in the Performance of Industrial Arts and Vocational Work.*** **Wayne University, 1940.**

An analysis of the results of questionnaires submitted to 110 teachers experienced in industrial arts. The questionnaires concerned the methods and values of having students analyze and plan procedures of work before starting their projects.

1877. HOYT, WALTER LEWIS. ***Teaching Technical Vocabulary In Industrial Arts Classes.*** **M. S., 1952, Kansas State Teachers College. 96 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To analyze the problem of teaching a technical vocabulary in industrial arts classes.

Source of Data: Data were obtained from literature, questionnaires, and by using experimental groups.

Findings and Conclusions: The result of an experiment in teaching a technical vocabulary to eighth grade students in metalwork is given and discussed.

1878. HRABOVSKY, EMERICK JAMES. ***Construction and Use of Selected Administrative Teaching Aids For Elementary Industrial Arts.*** **M. Ed., 1955, Wayne University. 87 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To present the construction details and the use of a number of teaching aids for elementary industrial arts.

Source of Data: Data were obtained from the volumes of Industrial Arts and Vocational Education magazine between the years 1930 and 1954 inclusive.

Findings and Conclusions: The construction details and the use of the following administrative teaching aids are presented in the study: a reversible demonstration rule, a nail and screw cabinet, a finishing room aid and brush keeper, a sandpaper cutter and distribution system, a sheet metal brake, a tool inventory system, an elementary school shop student management organization, an attendance and a student progress chart, tool holders, and electrical wiring panels.

1879. JACKSON, EDGAR W. (M. S.). ***A Motion Picture Film as a Means of Relating the Housing Problem to Architectural Drawing.*** **Colorado Agricultural & Mechanical College, 1939. 48 p.**

Actual production of a motion picture illustrating the development of a cooperative rebuilding a blight area. The aim is to vitalize architectural drafting in a city high school.

1880. JAEGER, GEORGE H. ***Drill Press Patterns.*** **M. A., University of Minnesota, 1948. 22 p.**

A study resulting in exploration of certain patternmaking construction principles used in redesigning a set of drill press patterns, the castings from which will be suitable for improved instruction in school machine shops.

1881. JEPSON, AUSTIN W. ***A Survey of Teaching Aids and Devices Presented in the Industrial Arts and Vocational Education Magazine Through 1930–1948.*** **M. Ed., 1948. Wayne University. 91 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To present a rated list of one thousand teaching aids and devices published in Industrial Arts and Vocational Education in the period from 1930 to 1948.

Source of Data: Data were obtained from The Industrial Arts and Vocational Education magazine.

Findings and Conclusions: In view of the fact that there have been few contributors and many contributions, many industrial arts and vocational education teachers who might have ideas to contribute may have hesitated to do so fearing that they might be duplicating something already published.

1882. JOHNSON, VICTOR A. (M. A.). ***Teaching Devices in Mechanical Drawing.*** **University of Minnesota, 1935. 143 p.**

An experimental study of sixteen matched pairs of students, first semester of the school year 1934–35, at Wayzata, Minnesota High School, comparing the use of models and of blueprints in the teaching of mechanical drawing.

1883. JOHNSTON, MARVIN M. ***Visual Aids in Industrial-Arts Instruction.*** **M. S., 1952, Illinois State Normal University. 83 p. Library, Illinois State Normal University, Normal.**

Purpose: To ascertain the practices of industrial-arts instructors with respect to the use of visual aids.

Source of Data: Data were obtained by use of check-lists sent to one industrial arts instructor in each public secondary school in the northern half of Illinois, with the exception of Chicago.

Findings and Conclusions: It was found that the following visual aids were used most frequently by industrial-arts instructors: bulletin boards, demonstrations, catalogs, advertising materials, charts, motion pictures, and sample projects.

1884. JONES, DAVID B. *Effective Teaching Aids for Reading a Rule.* M. Ed., 1954, Wayne University. 25 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To describe and illustrate teacher-made devices for teaching how to read a rule.

Source of Data: Data were obtained from interviews with fellow teachers, a review of literature, and personal experience of writer.

Findings and Conclusions: The difficulty students have in learning from a model may be due to the fact that the model is larger or smaller than the original, and the model may be over-simplified.

1885. KERR, GORDON E. *The Production of Sequence Slides by the Shop and Classroom Teacher.* M. Ed., 1949, Agricultural and Mechanical College of Texas. 20 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To discover possible solutions to certain problems in the use of visual aids through the production of teacher-made slides.

Source of Data: The need for teacher-made slides to supplement commercial film supplies was revealed and a study was made of materials available for the construction of slides by the teacher. Criteria for the production of teacher-made slides were developed. Slides were then constructed and evaluated in terms of the criteria developed.

Findings and Conclusions: Indicated that teacher-made slides are practical and feasible. Techniques in the use of teacher-made slides and their application to school situations were suggested.

1886. KING, WALLACE H. (Masters). *Some Teaching Aids for Teachers in Cabinetmaking and Mill Room Operations.* University of Kansas, 1940.

1887. KLIER, JOHN CHARLES (M. A.). *Teacher Preference for Commercial Supplementary Teaching Aids in the Field of Trade and Industry.* University of Maryland, 1948, 49 p.

A description based on data collected by the trade and industry section of the A. V. A. Committee on supplementary teaching aids, of teacher preference for commercial aids in vocational education.

1888. KNIGHT, RICHARD ORVILLE (Masters). *A Comparison of Two Methods of Teaching Related Information in School Shops.* Ohio State University, 1937.

1889. LAWRENCE, WALTER A. *An Experiment With Two Methods of Instructions In A General Metals Area.* M. A., 1952, The Ohio State University. 93 p. Library, The Ohio State University, Columbus.

Purpose: To compare the effectiveness of two methods of teaching.

Source of Data: Data were obtained by using two equivalent groups. One group was taught the job sheet technique, while the other group received oral instruction. A testing and evaluation program was established that consisted of two parts: a written test to measure the amount of related information learned, and a measure of the degree of progress on the project being constructed.

Findings and Conclusions: The oral instruction group did slightly better than the written instruction group, however, there was no sufficient difference between the two methods.

1890. LAWVER, EARL A. (M. S.). *A Study of Two Established Methods of Teaching Mechanical Drawing.* Colorado Agricultural & Mechanical College, 1936. 42 p.

An attempt to determine the relative value of work books, lectures, demonstrations, and individual instructions in teaching drawing.

1891. LEDBETTER, JAMES LUTHER (M. S.). *Visual Aids Furnished By Commercial Firms for Use in Industrial Arts Classes.* Oklahoma A. & M. College, 1941. 141 p.

A study pointing out the place of industrial arts in general education and indicating the use to be made of visual aids in improving instruction. Visual aids prepared by indus-

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trial concerns for use in school shop instruction up to 1941 are listed.

1892. LEET, H. G. (M. S.) *Basic Principles for Improving the Thinking Habits of Industrial Arts Students in the Field of Industrial Arts.* Colorado Agricultural & Mechanical College, 1940. 117 p.

A study to improve the thinking habits of industrial arts students. Examples of problem-solving techniques are included.

1893. LEITCH, RICHARD F. (Masters). *Techniques of Making and Using a Motion Picture for Training Skills in Industrial Arts.* Ohio State University, 1933.

1894. LEONARD, MARGARET. *The Origin, Nature and Classification of Free and Inexpensive Materials of Instruction.* M. Ed., St. Louis University, 1946. 67 p.

A survey of 300 items distributed through industries for use in high school and elementary schools to supplement the curricula.

1895. LERDA, LEWIS (M. S.) *A Controlled Experiment to Determine the Merits of Two Methods of Teaching Industrial Arts in the Junior High School.* Pennsylvania State College, 1934. 59 p.

An experiment using the parallel group technique to determine the advantages of correlating industrial arts shop work with fine arts work over the noncorrelation of these two subjects. A plan for the correlation of fine arts and industrial arts is proposed.

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1896. LEVENSON, WILLIAM B. (Doctors). *The Training of Radio Personnel: An Analytical Approach.* Western Reserve University, 1937.

1897. LOGAN, ALLETA TOWNSEND (M. S.) *Organization and Methods of Instruction in Cosmetology.* University of Southern California, 1941. 142 p.

A study discussing cosmetology as a trade, from the points of view of history and of the fundamental principles involved. It suggests procedures and methods for teaching which will give operators a wider background in their field.

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1898. LONDON, HOYT H. (Ph. D.). *Written Instruction in Industrial Arts Teaching: An Experimental Comparison of the Job-Sheet and the Operation-Sheet Methods.* Ohio State University, 1934. Published in abbreviated form, Ohio State University, 1934. 333 p.

A comparison of two methods of teaching shop work, including measurements of outcomes in terms of informational achievement, quality of work done, ability to analyze and plan, economy in use of materials, ease of handling groups, and student attitude toward methods used.

1899. LORENZ, ROSCOE ORRIN. *Blackboard Illustrations and Projected Slides as Teaching Devices in Beginning Freehand Drawing.* M. S., 1950, Iowa State College. 55 p. Library, Iowa State College, Ames.

Purpose: To contrast two methods of presenting materials in a class of beginning freehand drawing.

Source of Data: A control group was composed of 16 students and taught by blackboard methods. An experimental group of 13 students was taught by use of slides supplemented by discussion.

Findings and Conclusions: The two groups did not differ significantly in final growth of ability to draw. The only significant difference appeared to be in the experimental group's proficiency in recognizing errors in drawings.

1900. LOWMAN, DORANCE R. (Masters). *A Method of Evaluating Industrial Arts Motion Pictures, with Reference to the Teaching of Related Materials in Industrial Arts.* Ohio State University, 1935.

1901. LOWRY, EVERETT E. (Masters). *A Comparison of Methods and Devices Used in Teaching Curvilinear Perspective.* University of Chicago, 1930.

1902. LUHMAN, WILSON SANDS. *Selected Teaching Units.* M. A., 1954, University of Minnesota. 56 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To obtain a sampling of good teaching units from industrial arts teachers of the

Minneapolis public schools in the field of general metals and plastics.

Source of Data: Data were obtained from fourteen teachers who submitted printed material now used in their work.

Findings and Conclusions: Projects used vary considerably from one teacher to the next. Points of emphasis and preference also differ among the teachers. Printed teaching aids, such as job sheets, blueprints, tests, and information sheets, were not used as extensively as books, blackboard, commercial prints and plans.

1903. LULOW, ROY V. (M. S.). *A Comparison of the Effectiveness of the Lecture Method Versus Operation Sheets in Teaching the Techniques of Machine Woodworking to Senior High Students.* Iowa State College, 1933. 97 p.

A comparison of the effectiveness of teaching machine woodworking by means of lectures or by instruction sheets.

1904. MACKEY, ULRICH L. (M. S.). *The Contract Plan Applied to the Teaching of Advanced Automechanics.* Oregon State College, 1934. 60 p.

A suggested arrangement of progressive contracts for teaching automotive mechanics, based upon an analysis of the trade and comparative results at the high school level.

1905. MARION, RAYMOND DAVIS (Masters). *Visual Teaching-Aids for Hand-Tool Processes in Woodworking.* Oregon State College, 1940.

1906. MARTIN, JERRY L. (Masters). *A Plan to Improve Instructional Units in Elementary Printing.* Kansas State Teachers College, 1938.

1907. MARTIN, J. W. (M. S.). *An Experimental Determination of the Effectiveness of the Demonstration Method of Teaching Woodworking in Developing Skill.* Pennsylvania State College, 1933. 76 p.

Carries out, under controlled conditions, an experiment with twenty-seven trade carpentry students in a unit trade shop to determine the effectiveness of the demonstration method of teaching.

1908. McCULLOUGH, JAMES DE WITT. *The Development of Audio-Visual Aids for Teaching the Industrial Arts.* M. A., 1955, Middle Tennessee State College. 29 p. Library, Middle Tennessee State College, Murfreesboro.

Purpose: To make a series of filmstrips for teaching industrial arts wood and metal work, and a tape recording synchronized with the individual frames.

Source of Data: Data were secured from literature on teaching methods and devices and film strips made in the Middle Tennessee State College.

Findings and Conclusions: Much planning should go into the making of filmstrips. Teachers can save much time and expense by developing and printing their own film.

1909. McFARLAND, ROBERT C. *Techniques Involved in Securing Data and Outlining a Course of Study in Electrical Science for a Vocational High School.* M. Ed., University of Cincinnati, 1946, 214 p.

An analysis of the methods used in securing instructional material in the vocational field. It includes an analysis of the work of the electrician and an example of techniques to be used.

1910. McKELL, WILLIAM E. *The Development of a Thermoplastic Welding Attachment for Use with an Acetylene Torch.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 34 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To develop an attachment for an acetylene or natural gas torch for welding certain thermoplastic materials.

Source of Data: Data were obtained from books, periodicals, encyclopedias, and unpublished material.

Findings and Conclusions: No specialized processes, tools, or techniques are necessary to construct an attachment to use with an acetylene-air flame for the welding of certain thermoplastics. The attachment can be used with standard equipment, and its use requires no specialized training.

1911. McKNIGHT, HAROLD WILLIAM (M. S.). *Some Effects Of Projected Audio-Visual Aids In Senior High*

School Industrial Arts Metalworking. **Iowa State College, 1948. 57 p.**

A survey to test the effectiveness, in a high school industrial arts metalworking classroom situation, of two projected audio-visual aids units produced by the Division of Visual Aids for War Training, U. S. Office of Education.

1912. McLAURIN, DENNIS H. *A Study of Visual Aids Used in the General Shop.* M. A., 1953, Sam Houston State Teachers College. 86 p. Library, Sam Houston State Teachers College, Huntsville, Tex.

Purpose: To compare the use of visual aids in the general shops in Texas with the best current visual aid practices, and to present instructions on the use of visual aids.

Source of Data: Data were obtained from published materials, research reports, and from general shop teachers.

Findings and Conclusions: Not enough teaching aids are being used by most of teachers to do a well-rounded job of teaching. Most teachers would use more teaching aids if the school would furnish them and if proper storage space was available.

1913. McSPADDEN, C. B. *An Experimental Investigation of the Relative Effectiveness of Two Methods of Teaching Mechanical Drawing.* M. S., 1950, North Texas State College. 60 p. Library, North Texas State College, Denton.

Purpose: To compare by experiment 2 methods of teaching mechanical drawing in the seventh grade and to determine which of the 2 methods is superior.

Source of Data: The experiment included 4 classes with a combined total of 83 pupils. Students in 2 of the classes were taught by the block method and students in the other 2 classes by a problem book method. An achievement test was administered in order to measure the achievement of the students under each method.

Findings and Conclusions: The study did not prove that one method was superior to the other for teaching seventh grade mechanical drawing. However, students achieved more visualization when taught by the block method than by the problem book method.

1914. MICHIGAN, UNIVERSITY OF, OFFICE OF VOCATIONAL EDUCATION. *An Effort to Do Things Better.* (A Special Study.) 33 p. Office of Vocational Education, University of Michigan, Department of Public Instruction, Ann Arbor.

Purpose: To present certain progressive practices and projects in selected Michigan schools.

Source of Data: Compilation of a series of reports from Michigan schools covering one or more phases of vocational education.

Findings and Conclusions: Reports were received from various schools covering the following phases of vocational education: A survey of the characteristics and educational needs of persons in part-time farming; one school made a survey of a vocational agricultural program; a cooperative evaluative study of the homemaking program and its relationship to the total educational system; a sound method of developing family living classes; evaluation of a day trade program; use of records; community occupational survey; a business education survey; selection of distributive education students; evaluation of a business education department; a survey of office and retail occupations; and the vocational training program of 4 towns working as one.

1915. MILLER, SAMUEL (Masters). *A Study of the Relative Value of Combined and Segregated Instruction in Related Science and Mathematics.* University of Pennsylvania, c. 1935–47.

1916. MONROE, LYNNE C. (M. S.). *The Effect Upon Recognition of Various Forms of Tools Representation.* Iowa State College, 1932. 89 p.

An experimental study to determine the relative ease of recognition of half-tone representation of tools as compared with line-drawing representation.

1917. MONTGOMERY, FRANCIS D. *A Program of Woodwork Emphasizing the Use of Visual Devices.* M. A. E., 1954, University of Florida. 156 p. Library, University of Florida, Gainesville.

Purpose: To analyze visual materials, teaching methods, and philosophies which will help improve instruction and facilitate learning.

Source of Data: Data were secured from technical and professional publications.

Findings and Conclusions: The increased use of visual devices in industrial arts instruction is professionally sound. A course of study is proposed for the Robert E. Lee High School.

1918. MONTGOMERY, HAROLD A. *Use of Modern Industrial Photographs as a Teaching Aid and Their Affect on Learning.* M. S. 1954, Purdue University. 43 p. Industrial Education Office, Purdue University, Lafayette, Ind.

Purpose: To ascertain the effectiveness of modern pictures as teaching aids.

Source of Data: Test results of a control group were compared with test results of an experimental group of freshman engineers taking a course in manufacturing processes.

Findings and Conclusions: It was found that photographs of modern manufacturing processes and equipment do help a class to better understand the subject matter.

1919. MOORE, CLAUD ALFRED (M. A.). *Instructional Units in Industrial Arts for the Peabody Demonstration School.* George Peabody College, 1934. 128 p.

An analysis of the instructional units for each course in the industrial arts program of the Peabody Demonstration School for the purpose of pointing up the advantages of well written instruction sheets.

1920. MORGAN, NORMAN W. (M. S.). *A Controlled Experiment on Relative Value of Models and Textbook versus the Textbook in the Teaching of Mechanical Drawing.* Pennsylvania State College, 1938. 43 p.

The description of a controlled experiment using equated groups to determine the relative value of using models in conjunction with a textbook as against using only a textbook. Includes a copy of each text used.

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1921. MULLER, ERWIN T. (Ph. D.). *A Comparison of Two Methods of Teaching Representational Drawing in a Secondary School.* New York University, 1938. 179 p.

A study, conducted at the Hebrew Technical Institute in New York City, of two groups of students who were taught representational drawing by different methods. The aids used in perspective drawing, teaching procedures, and student evaluation are discussed.

1922. MUSSELMAN, LEONARD W. *Problems of Methods in Teaching Industrial Arts.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 64 p.

Seventy-three distinct methods and techniques of presenting theory lessons and on conducting shop practice periods are isolated, named, and discussed in this thesis. These named methods are those discussed by the same name in some textbooks on industrial arts teaching.

1923. MYERS, MYRON C. *The Effectiveness of the Threat of Failure as a Motivating Device in Ninth Grade General Science.* M. A., University of Minnesota, 1937. 86 p.

Report of an experiment conducted with 3 ninth grade science classes to show what effect the threat of failure might have as a motivating device.

1924. NEFF, JULIUS CLEVELAND (Masters). *A Study of Devices and Methods Used by Industrial Arts Teachers for Vocational Guidance.* Ohio State University, 1939.

1925. NELLIS, ALEXANDER ALLEN (M. A.). *Architectural Models as a Teaching Device.* Ohio State University, 1933.

An experimental study to determine to what extent the use of models, in conjunction with the regular architectural drawing course, affected the work of the pupils. An evaluation of this technique is included.

1926. NELSON, PAUL C. (M. S.). *Selection, Preparation, and Presentation of Projected Visual Instruction Material.* Iowa State College, 1934. 101 p.

An attempt to discover and set forth the fundamental information about the pedagogical and mechanicial technique involved in the instructional use of visual aids. Twenty different schools in various states were investigated.

1927. NELSON, THOMAS W. (M. S.). *A Comparative Study of Two Methods of Teaching Tool Operations in Beginning Woodwork.* Colorado Agricultural & Mechanical College, 1936. 69 p.

A study to measure the comparative effectiveness of teaching tool operations by two methods: (a) instruction by use of tool operation sheets and charts, and (b) instruction by the lecture and demonstration method.

1928. NEWTON, CARL. ***Uses of Visual Aids in Vocational Programs.*** **M. S., Oklahoma Agricultural and Mechanical College, 1947. 39 p.**

A description of the uses and limitations of visual aids, to facilitate a better understanding of them by those who will use and supervise their use in vocational education programs.

1929. NIDES, NICHOLAS G. (M. A.). ***An Evaluation of Illustrative Material for Teaching Industrial Arts.*** **University of Maryland, 1942. 65 p.**

An analysis of the opinions of supervisors, teachers, and administrators regarding the illustrative aids and consisting of materials and pictures produced as exhibits by manufacturers, which are used in industrial arts departments.

1930. NILES, REX A. ***Mechanical Aids to Assist in the Teaching of Drafting.*** **M. S., 1949, Oklahoma Agricultural and Mechanical College. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To plan the procedures that might be used by an instructor who is introducing the subject of drafting into the industrial arts curriculum for the first time through a study of mechanical aids.

Source of Data: The library technique was used in seeking the facts relating to mechanical aids. The writer supplemented the research with the experiences of instructors in the field of drafting.

Findings and Conclusions: Progress in the development of a drafting laboratory that is functional in the modern industrial arts program has been relatively slow. The drafting laboratory should be so organized in regard to the general arrangement, equipment, and supplies, that it can be judged on the basis of capacity, utility, speed and such other qualities as might increase production and quality of work.

1931. NORDEN, PETER V. ***An Economic Evaluation of the Use of Motion Pictures in the Training of Industrial Workers.*** **M. A., 1952, Columbia University. 95 p. Library, Columbia University, New York.**

Purpose: To evaluate the economic aspects of the use of the motion picture as an aid to effective training of civilian industrial workers.

Source of Data: Data were obtained from U. S. Government publications, reports from industries, research studies in the field, interviews with authorities, and a study of two companies, one with a film-training program and one without.

Findings and Conclusions: Sound motion pictures as a training tool can teach upwards of 25 per cent more effectively than conventional training methods. Improved employee-management relations, upgrading of present employees, lunchtime information movies, supervisory training, and similar possibilities may result from the acquisition of projection equipment.

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1932. NORMAN, RALPH PAUL. ***An Experimental Investigation to Determine the Relative Effectiveness of Two Different Types of Teaching Methods in Engineering Drawing.*** **Ph. D., 1955, University of Minnesota. 216 p. Library, University of Minnesota, Minneapolis.***

Purpose: To ascertain the differential effects of two methods of instruction in engineering drawing.

Source of Data: Data were obtained by using a sample of 56 students randomly assigned to four sections in the beginning course in engineering drawing. Two of the sections first learned the basic principles of orthograph drawing through the medium of freehand drawing and then proceeded to develop skill in instrument drawing. The other two sections made all of their drawings with drawing instruments.

Findings and Conclusions: The experimental factor, freehand drawing, effected superior learning of the fundamental principles of orthographic drawing. A definite conclusion could not be reached in regard to the effectiveness of the instruction in developing the ability to draw freehand. The students who used the freehand drawing method were not penalized with respect to developing the skills necessary for satisfactory instrument drawings.

1933. OLDHAM, OSCAR FRAZIER. ***A Comparative Analysis of Methods of Teaching Industrial Arts Education.*** **M. S., Oklahoma Agricultural and Mechanical College, 1935. 109 p.**

A comparative study of the content of available textbooks on methods of teaching industrial arts, by listing the items omitted, those overemphasized, and those adequately discussed.

1934. OLIVE, WILLIAM T. *The Use of Projected Pictures for Industrial Arts Teaching.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 59 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To acquaint the writer with the use of films in the teaching of shop classes.

Source of Data: Questionnaire addressed to county superintendents, high school superintendents, and presidents of institutions of higher learning.

Findings and Conclusions: Films could be used in vocational guidance courses to give pupils an insight into a number of vocations. The list presented should serve as a guide for those wishing to use motion pictures or slides as related material in their teaching.

1935. OSBURN, DOUGLAS C., Jr. *Silk Screening as an Economical Reproductive Process Applicable to Small Industry and School Shop.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 37 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To show that silk screening can be used as an economical reproductive process in small industry and the school shop.

Source of Data: Data were obtained from books.

Findings and Conclusions: The economy and versatility of the silk screen process make it applicable, in every way, to the small industry and the school shop.

1936. OXLEY, RICHARD E. (M. Ed.). *A Study of the Educational Value of Group Projects in Industrial Arts on a Secondary Level.* Ohio State University, 1940. 96 p.

This study is largely a description of the author's experiences in supervising the work of groups of grade school boys and high school boys while they constructed scale models of steamships. These group projects involved work with both wood and metal.

◆ 1937. PAINE, OLIVE (Doctors). *An Experimental Study of Two Methods of Teaching Manual Arts in the First Grade.* Yale University, 1930.

1938. PARNELL, R. B. (M. Ed.). *Development and Use of Pictorial Drawing in Modern Industry.* Colorado Agricultural & Mechanical College, 1947. 95 p.

An account of the trends, types, and uses of pictorial drawing in industry from 1900 to 1948.

1939. PARR, KENNETH E. *The Demonstration in Industrial Arts.* M. A., 1950, University of Minnesota. 141 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To analyze the demonstration techniques as employed by industrial arts instructors in the public schools of Minnesota.

Source of Data: Visitation of classrooms and study of demonstrations being given. Evaluation by questionnaire to industrial arts teachers of Minnesota.

Findings and Conclusions: The planned group demonstration ranks first in the method of teaching. There is a need for improvement in teaching techniques and training in the teaching methods.

1940. PATE, W. C. (M. S.). *A Plan of Individual Instruction in Arithmetic for Beginning Students at Forth Worth Technical High School.* Colorado Agricultural & Mechanical College, 1939. 143 p.

An outline for all the necessary mathematics needed by the student in handling simple problems in the trade mathematics course.

1941. PETERSON, ROBERT S. *The Production and Use of a Filmstrip in the Mechanical Drawing Program.* M. A., 1950, University of Minnesota. 90 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To provide information on the making of filmstrip for classroom use.

Source of Data: A historical research.

Findings and Conclusions: A detailed explanation is provided on how to produce a filmstrip as well as suggestions as to the best uses and ways of constructing necessary equipment at low cost. Improvement of instruction will come through the use of filmstrip produced with relatively simple equipment.

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1942. PHILLIPS, JOSEPH WARREN (Ph. D.). *Mechanical Devices as Aids in the Teaching of Aviation, Described and Illustrated.* **New York University, 1935. 326 p.**

A description of fifty-three devices in an effort to explain the various principles of applied science to aviation, navigation, and the airplane engine. These devices were used to prepare lecture and demonstration methods of teaching.

1943. POBANZ, THOMAS C. *Film Teaching Plans for General Metal Classes.* **M. Ed., 1950, Wayne University. 66 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To evaluate and classify select films for general metal classes at the ninth grade level.

Source of Data: Data were obtained from books and periodicals and viewing of films available in Detroit Public Schools.

Findings and Conclusions: The writer recommends the use of lesson tryouts in a study of this type. Film teaching plans such as these should be developed and made available to teachers. A discussion and selection of films for general metal classes at the ninth grade level plus teaching plans for this selection are included.

1944. POWER, CHARLES EVERETT. *A Study of Visual Aids as a Teaching Device as Applied to Eighth Grade General Metal Work.* **M. A., 1949, Ohio State University. 42 p. Educational Library, Ohio State University, Columbus.**

Purpose: The purpose of this study was to determine the effectiveness of visual aids as a teaching device.

Source of Data: The experimenter had 2 groups of students, each equal in ability. One group was used as the control group, the other the experimental group. The groups were compared as to scores made on the California Test of Mental Ability.

Findings and Conclusions: Results of the experiment show: The experimental group—the group subjected to visual aids—shows a total gain of 43.3 points on the average over the scores of the pre-tests or an increase of 24.5 per cent, while the control group only gained 38.7 points or 22 per cent over the pre-tests. This gives the experimental group a greater total gain of 4.6 points or an increase of 2.5 per cent over the results of the control group. It may be concluded from the difference between the mean gains shown that for this particular group more effective teaching was accomplished through the use of motion pictures. The increase in efficiency of 2.5 per cent while not a striking gain, was as far as groups concerned, a positive gain. The evidence resulting from this experiment seems to justify the use of motion pictures and films as a teaching aid.

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1945. RAY, J. EDGAR (Doctors). *The Graphic Method of Teaching Architectural Drafting in the Senior High School, Vocational and Adult Schools, and Teacher-Training Institutions.* **New York University, 1944.**

1946. REPPERT, OWEN D. *The Development of An Audio-Visual Production Concerning Student Activities at Appleton High School.* **M. S., 1952, Stout State College. 33 p. Library, Stout State College, Menomonie, Wis.**

Purpose: To select, plan, and produce an audio-visual medium to aid incoming high school sophomores in the planning of their high school careers.

Source of Data: Data were obtained from a review of literature in this phase of audio-visual education.

Findings and Conclusions: An original audio-visual production was developed. Suggestions are given as to how to plan school productions and the selection of suitable mediums and equipment for filming these school productions.

1947. RHETTA, HENRY STEVENS. *Effects of Using Audio-Visual Aids in Teaching Hand Tool Safety in Seventh Grade Industrial Arts.* **M. S., 1953, Iowa State College. 30 p. Library, Iowa State College, Ames.**

Purpose: To ascertain the effectiveness of audio-visual aids in teaching hand tool safety in seventh grade industrial arts.

Source of Data: The study was conducted in the Divoll School, St. Louis, Missouri. The unit of safety covered three class periods, in which the experimental group was taught by use of films and the control group by use of demonstrations. Analysis of covariance was used to handle the data.

Findings and Conclusions: The advantage was in favor of the experimental group at the 5 per cent level of significance.

1948. RICHARDS, MAURICE FRANCIS. *Effect of Emphasizing Time in the Teaching of Engineernig Drawing.* Ph. D., 1950, University of Missouri. 341 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the effect on achievement in engineering drawing when emphasis and premiums are placed on the time element in teaching the subject.

Source of Data: A two group method of experimentation, involving 171 students enrolled during one semester in a basic drawing course, was used in this study. The degree of equivalency and possibilities for growth of the separate groups was ascertained. The following outcomes were measured: Information gained, skill achieved, attitudes developed toward the course, attitudes developed toward the instructor, and differences in teaching.

Findings and Conclusions: No appreciable effect appeared to be reflected on the amount of technical drawing information gained by the students. No appreciable effect appeared to be reflected on the drawing skill acquired by the students. Students drawing under pressure of time seemed to have a more favorable attitude toward the subject than did those students not working under this pressure. Students drawing under pressure of time appeared to have a higher regard for the teaching ability, fairness, and cooperation of their instructor than did those students not subjected to this pressure. Instruction factors such as ease of teaching, class discipline, pleasant relations with students, appeared to be more easily obtained by the instructor when his students were required to draw under pressure of time.

1949. RICHARDSON, JAMES F. *The Use of Audio-Visual Aids in Vocational Trade and Industrial Schools and Classes in Tennessee.* M. S., 1949, The University of Tennessee. 79 p. Library, University of Tennessee, Knoxville.

Purpose: To ascertain the amount, type, and condition of audio-visual equipment owned by each school, the extent of the use of such aids during the school year 1948–49 together with any inhibiting factors; and to compile a list of sources of equipment, materials, and other information on audio-visual aids.

Source of Data: Data were secured from 92 questionnaires sent to 170 directors, coordinators, instructors of shop and related subjects, and teachers of vocational trade courses.

Findings and Conclusions: In the larger schools more different types of aids were used. There is a widespread use of both mechanical and non-mechanical aids. Field trips are employed rather extensively. The report on audio-visual aids indicate: Available audio-visual aids do not adequately cover 57 percent of the course of study. More funds are needed by 24 percent to purchase more or better equipment. Forty percent have inadequate room or facilities for using audio-visual aids. Thirty-nine percent lacked information on desirable films and other aids. Ninety percent stated the equipment was in good condition. Included is an excellent list of sources of equipment, materials, and other information.

1950. RIDGWAY, CARROLL M. *Instructional Films and Film Strips for Industrial Arts Classes.* M. S., 1950, Oklahoma Agricultural and Mechanical College. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To analyze motion picture films and film strips that may be used in industrial arts, and to establish a film evaluation scale.

Source of Data: Examination of available catalogs, current literature, booklets and theses.

Findings and Conclusions: Successful use of motion pictures depends upon a preview of the film, what the teacher does after the film has been shown, and the teacher's planning of physical details such as projection equipment, seating arrangement, lighting of the room and operation of the projector.

1951. ROGERS, RALPH W. (M. S.). *Visual Aids as a Means of Making the Subject of Woodwork in the Secondary Schools More Intellectual.* Oklahoma A & M College, 1932. 55 p.

A survey of the content and use of visual aids in teaching woodwork in a selected group of schools during the year 1931–1932. Visual aids in common use are listed and needed improvements are suggested.

1952. ROLL, CARL L. (M. S.). *Related Information Teaching Methods for Junior High School Industrial Arts, Rated by Selected Teachers, Supervisors and Teacher Trainers.* The Stout Institute, 1939. 84 p.

A survey of 162 industrial arts teachers, supervisors, and teacher trainers throughout the United States to determine the best methods for teaching industrial arts related information in the junior high school.

1953. ROOT, HAROLD H. (M. A.). *An Experimental Study to Determine the Effectiveness of Models as an Aid in Teaching Mechanical Drawing.* Ohio State University, 1934. Published Ohio State University, 1934. 97 p.

A comparative study of two groups, the traditional textbook group and the group using models, to determine which group made the more rapid progress and achieved the greater skill in mechanical drawing.

1954. ROSE, HOMER CLINTON (M. S.). *A Determination of the Effectiveness of Certain Methods of Hand Lettering in the Junior High School.* Iowa State College, 1937. 90 p.

A study comparing the effectiveness of a wire lettering guide (patented by the author) with the effectiveness of the use of guide lines for junior high school students when lettering in mechanical drawing classes.

1955. RUBY, DONALD W. *Effectiveness of a Motion Picture and a Demonstration in Teaching a Unit on Fuses in Basic Electricity.* M. S., 1952, Iowa State College. 37 p. Library, Iowa State College, Ames.

Purpose: To ascertain the relative effectiveness of a motion picture film and a demonstration in teaching a unit on fuses.

Source of Data: The study included 12 classes in basic electricity in South High School, Omaha. Nebraska. The experimental group of six classes was given a film as a review for a unit on fuses. The control group was given a demonstration as a review. The group was tested, and after six weeks re-tested. Analysis of covariance was used to test group differences.

Findings and Conclusions: No advantage was found in using the film over a demonstration in either testing.

1956. RUSSEL, WILBUR DAVID (Masters). *A Course of Study, Teaching Materials, and Testing Procedure for Industrial Arts Auto Shop in a Senior High School.* Stanford University, 1936.

1957. RYBNICK, FRANK. *Industrial Arts Projects And Instructional Aids For Elementary Teacher Education.* M. S., 1954, Kansas State Teachers College. 66 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a list of suitable projects and instructional aids for use by elementary teachers in the area of wood crafts.

Source of Data: Data were obtained from literature, interviews, and laboratory work.

Findings and Conclusions: Drawings of projects and instructional aids, with photographs were developed. A list of needed tools and finishes with supply houses is included.

1958. SAILORS, GORDON B. *Multi-Sensory Aids in Teaching Industrial Arts Woodwork.* M. S. in Ind. Ed., 1949, Kansas State Teachers College. 129 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To enumerate, define, and construct effective multi-sensory aids relating to woodwork.

Source of Data: Analysis of pertinent literature and construction of charts, models mockups, and other visual devices for use in the teaching of woodwork.

Findings and Conclusions: The use of multisensory aids in the field of woodworking has a long history and includes models, demonstrations, exhibits and school journeys. The multi-sensory aids designed and constructed as a part of the study were found to be effective in difficult teaching situations.

1959. SCHEIBE, WARREN C. *Measuring Instruments in Industrial Arts Woodshop.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 76 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the place and use of measuring instruments in the senior high school industrial arts woodshop.

Source of Data: A check list of uses were sub mitted to 50 industrial arts teachers.

Findings and Conclusions: A list of learning units was set up which would provide suitable learning content for teaching the use of measuring tools and devices in the woodshop.

1960. SCHLETER, GEORGE H. (M. A.). *An Investigation of Acquiring Skill in Electric Splicing.* University of Pittsburgh, 1938. 48 p.

An investigation to ascertain how skill in electric splicing was acquired by 173 junior high school boys during a five-month period and by forty boys during a ten-month period. The study measured the degree of skill, or achievement, in making Western Union and Tee Splices.

1961. SCHMIDT, MILTON E. *Visualization in Testing Mechanical Drawing.* M. A., University of Minnesota, 1939. 88 p.

A documentary study of tests and test literature concerning drawing at the high-school level.

1962. SCHOENHALS, NEIL LESLIE. *An Investigation of Student Selection of First Year Mechanical Drawing Problems.* M. A., 1950, University of Michigan. 49 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To determine whether first year mechanical drawing students would select meaningful problems (those within their experience and understanding) in preference to typical abstract problems (those outside their experience and understanding) as a basis for further research to develop a new textbook in beginning mechanical drawing.

Source of Data: All beginning mechanical drawing textbooks on the market and the course of study from several school systems were analyzed to determine what constituted typical abstract problems. Oral investigation and a written questionnaire were employed in finding out from the students what problems were meaningful. Thirteen problems of each type were paired off, and prints of them were submitted to one hundred eighty-six students for selection.

Findings and Conclusions: In eleven of the thirteen cases, the meaningful problems were chosen in preference to the abstract ones. Sixty-three per cent of the individual choices were for meaningful problems. It was concluded that typical drawing problems in nearly all beginning texts were abstract, and not meaningful to a large majority of beginning drawing students. Likewise, it was concluded that a large percentage of students would prefer to draw meaningful problems, and that their efficiency of learning would be increased. Instructors and textbook writers, alike, may note the immediate implications of this fact for the development of drawing problems in beginning classes.

1963. SCOTT, GORDON E. (M. S.) *The Use of Lantern Slides, Film Strips and Sound Films in Teaching Industrial Arts.* Oklahoma A & M College, 1943. 90 p.

This study deals with the history, development, and present (1943) application of visual aids in the teaching of industrial arts.

1964. SEEFELD, KERMIT A. (M. Ed.). *Technical Information for Teachers of General Metal Shop Courses.* Colorado Agricultural & Mechanical College, 1946. 111 p.

Information units for teachers of metal work. Twenty-two units of information are compiled in a series of information sheets.

1965. SETTER, LEON JOSEPH. *Some Teacher Contributed Visual Aids Designed to Increase Instruction Effectiveness in Teaching Metalwork.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 80 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To show how visual aids in the metalworking field can be made when no commercial aids are available.

Source of Data: Designed, built, and demonstrated the use of selected three-dimensional aids for the field of metalworking. These problems were listed as the most desirable on questionnaires returned by metalworking teachers.

Findings and Conclusions: Constructed visual three-dimensional aids on: Thread terminology, reading the hundredths rule, showing the functions of idler and compound gears, the vernier bevel protractor. The report gives drawings, specifications, and photos of each design. Criteria for evaluating visual aids are included.

1966. SHESLER, FRANKLIN B. (M. S.). *Freehand Drawing: An Approach to Drafting Theory at the Secondary School Level.* Oregon State College, 1947. 100 p.

A study based on the opinions of drawing teachers, industrial draftsmen, and employers of draftsmen. It recommends an increased emphasis on sketching and freehand drawing as an introduction to drafting theory.

1967. SHOEMAKER, EDWIN ALLEN (M. A.). *A Comparative Study of Two Methods of Teaching Drawing (Guide Sheet Method Versus Oral Method).* Ohio State University, 1939. 219 p.

A comparison of two methods of teaching drawing. The written assignment group was the control group and the experimental group was the one receiving the customary oral assignments. The study was carried out for a high school semester.

1968. SHOTWELL, HERBERT D. *A Comparison of the Cooperative Method of Teaching Filing with the Traditional Textbook Method.* M. Ed., Colorado Agricultural and Mechanical College, 1946.

A comparative analysis of methods of teaching filing.

1969. SIMPSON, J. L. (Masters). *A Survey of the Methods, Techniques, and Procedures Used in Teaching Slow-Learners in Industrial Arts in Indiana.* Indiana State Teachers College, 1940.

1970. SLOTHOWER, LESTER E. (M. A.). *Electrical Drafting Survey.* University of Pittsburgh, 1938.

An analysis of symbols and techniques used in industrial electrical drafting with an explanation of the value of teaching in industrial arts programs.

1971. SMITH, JESSE E. (Masters). *An Experience in Teaching Drawing by the Individual Method.* Ohio State University, 1935.

1972. SMITH, JOHN ALLAN (M. A.). *Some Suggested Criteria for the Evaluation of Printing.* Stanford University, 1936. 308 p.

A study to set up criteria for judging the quality of printing.

1973. SPEER, JOHN MILLARD (M. S.). *Visualization of Selected Sheet Metal Patterns by the Use of Animated Motion Pictures.* Oregon State College, 1940. 78 p.

A presentation of plans for constructing and suggestions for organizing and presenting animated type movies for teaching pattern drafting.

1974. STALDER, HAROLD IRVIN. *Speed and Pattern Distribution as Factors in the Perception of Relative Motion Under Conditions of Low Illumination.* M. S., 1951, Iowa State College. 73 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effect of speed and pattern distribution upon the perception of relative motion under conditions of low illumination.

Source of Data: A perception time was secured for each of 30 subjects along with a speed and direction estimate of a moving pattern under controlled light intensities.

Findings and Conclusions: Speed, direction, and perception were improved when facing simulated low beam head lamps as opposed to high beam head lamps. In general, it was found that an increase in the magnitude of speed differential and increasing visibility of target decreased judgment time and difficulty.

1975. STEGMAN, HARRY (M. S.). *Bulletin Board Charts for Architectural Drawing.* The Stout Institute, 1939. 123 p.

A survey of 150 architects and teachers of architectural drawing to validate an architectural drawing course of study taught by means of bulletin board charts. Material for teaching architectural drawing by a series of bulletin board charts is included.

1976. STEVENSON, GLENN LYLE. *A Comparative Study on Two Ways of Presenting Geometrical Construction in an Elementary Drawing Course.* M. S. in Ind. Ed., Kansas State Teachers College, 1954. 30 p.

An experimental study of two approaches to the teaching of geometrical construction in drawing.

1977. SYLVESTER, JULIAN H., Jr., *Model Building in General Education.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 50 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain the place of model making in industrial arts and to study the various kinds of model building for the purpose of indicating improvements needed in kits, plans and instruction.

Source of Data: Literature was surveyed to ascertain whether model building in industrial arts is justified. Typical examples of model building were studied and operations common to industrial arts and model building were analyzed to ascertain their order of difficulty.

Findings and Conclusions: Model building serves the objectives of industrial arts in general education. Improvements were suggested which were calculated to increase the educational value of model kits.

1978. THIEDE, ALFRED L. (M.S.). *A Determination of Methods and Practices to be Recommended in the Giving of Demonstrations to Industrial Arts Shop Classes in the Junior High School.* Iowa State College, 1933. 57 p.

A study summarizing the opinion of 201 high school and teacher-training men with reference to demonstration. Consideration is given to such topics as preparation for the demonstration, tools and materials to be used, use of supplemental instructional material, length of the demonstration period, when during the class period demonstration should be given, success factors entering in a demonstration, pupil discussion and participation, and summary of the demonstration.

1979. THOMPSON, HAROLD E. (M.S.). *The Use of Visual and other Sensory Aids in Teaching Shop and Related Subjects in Industrial Schools and Departments.* Pennsylvania State College, 1935. 90 p.

A study to determine the extent to which visual aids are being used throughout the United States by leaders in industrial education on a secondary level. It considers the kinds of aids used most and the time devoted to their use in successful industrial education programs.

1980. TIVIS, HAROLD BERNARD. *An Established Demonstration Procedure for Presenting a Manipulative Job on an Educational Television Program.* M. S., 1955, Kansas State Teachers College. 46 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a procedure for the demonstration technique of teaching in the field of industrial arts for television broadcasting.

Source of Data: Data were obtained from a survey of television techniques.

Findings and Conclusions: There is a trend toward organized education on television. Numerous devices and techniques are available for television demonstrations in the field of industrial arts.

1981. TUCKER, R. F. (M.S.). *A Comparative Study of Teaching Electricity in Junior High School.* Colorado Agricultural & Mechanical College, 1937. 95 p.

A comparison of two methods of teaching electricity: (a) by the use of instruction sheets, and (b) by the lecture and demonstration method.

1982. TWOGOOD, ARTHUR P. (M.S.). *Teaching Fundamentals of Mechanical Drawing to Beginners by Means of Film Slides.* Iowa State College, 1931. 109 p.

A comparison of the effectiveness of teaching the various operations of elementary drawing by means of slides and by the usual lecture-discussion-demonstration method.

1983. VANDEBERG, LOYD W. (M.S.). *Methods of Promoting Personality Development through Industrial Arts Education.* The Stout Institute, 1947. 83 p.

A frequency check of eighty doctoral dissertations completed between 1934 and 1945 for the purpose of reviewing, classifying, and presenting methods of personality development possible through industrial arts.

1984. VAUGHN, HORACE BERKLEY. *Visual Aids for Woodworking.* M. A., Colorado State College of Education, 1933. 97 p.

A descriptive analysis of what visual aids are available in the teaching of woodworking, as determined from both producers of such materials as well as from consumers.

1985. VIDAK, ANTHONY A. *A Comprehensive Study of Visual Aids in the Field of Industrial Automotive Education.* M. A., 1952, Chico State College. 79 p. Library, Chico State College, Chico, Calif.

Purpose: To analyze the use and availability of free visual aids from the manufacturers of automotive equipment for use by auto mechanics instructors.

Source of data: Data were obtained through a form filled out by 92 manufacturers in the automotive industry.

Findings and conclusions: There is an abundance of material available such as charts, catalogs, pamphlets, samples, posters, manuals, and booklets.

1986. VOGEL, ROBERT TERRANCE. *The Construction of Two Types of Visual Aids and A Comparison of Their Effectiveness When Used in Teaching Automotive Wiring.* M. A., 1955, Chico State College. 48 p. Library, Chico State College, Chico, Calif.

Purpose: To construct two automotive visual aids, one a live mock-up of an automotive electrical system, the other an enlarged wiring diagram of an identical automotive electrical system, and to compare the effectiveness of the two in teaching automotive wiring.

Source of Data: Two matched groups of high school students in beginning auto mechanics were selected. One group was subjected to an intensive study for three periods on consecutive days, using the live electrical mock-up and inoperative units. The other group was subjected to the same study, using an electrical diagram to trace the wiring connections and inoperative units. A pre-test was given, which consisted of drawing wiring connections on a schematic diagram. At the end of the experiment this was repeated, and a performance test was given, which consisted of placing the same wire in an actual automotive installation.

Findings and Conclusions: The lower performance of the experimental group using the live mock-up suggests the abandonment of this device in favor of the wiring diagram in teaching wiring circuits. It does not imply that the live mock-up is not useful in teaching the function, repair, and adjustment procedures on individual automotive electrical units.

1987. WAGNER, ELDON THEODORE (M. S.). *The Use of Books and Magazines in the Teaching of Industrial Arts in Oklahoma.* Oklahoma A & M College, 1935. 85 p.

A study of the use of written instruction material in the industrial arts shops of Oklahoma, with suggestions concerning the need for state courses of study incorporating the use of books and state supervision.

1988. WARNER, MARION E. (M. S.). *Recommended Practices in the Use of the Project Method in Teaching High School Industrial Arts.* Iowa State College, 1933. 84 p.

A study based on the opinions of 203 high school industrial arts teachers and teacher trainers in colleges and universities. Such topics as the following are considered: use of jigs and fixtures, class discussions, assignments, use of instruction sheets, class organization, production work, demonstrations, and length of projects.

1989. WATERS, KENNETH B. (Masters). *An Evaluation of Learning in Power Engines Classes as Affected by Teaching Methods and Length of Class Periods.* University of Kentucky, 1941.

1990. WEBER, WALTER B. (M. Ed.). *An Analytical Study of the Model Electric Train System as a Project in Teaching Electricity in Junior High School.* University of Buffalo, 1935. 75 p.

A description of a junior high school electricity course using the electric train as the major project. Course theory and practice of fundamental knowledge are presented by means of its application to the electric train.

1991. WEBSTER, JOHN ALLEN. *A Comparison of Three Methods of Teaching The Drawing and Planning Unit of A First-Year Industrial Arts Laboratory.* M. of I. A., 1953, North Carolina State College. 59 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the best method in teaching project planning in the first year of the general industrial arts laboratory.

Source of Data: The study involved three controlled groups of ninth grade general shop students, each using a different method of teaching drawing and planning.

Findings and Conclusions: A brief introduction to the principles of drawing and planning should give the student the necessary background to plan his projects and progress independently with a minimum of direction from the instructor. Extended drill destroys the natural motivation of the shop program.

1992. WEEKS, J. W. *Descriptions and Directions for Use of Twenty Special Teaching Devices for Household Mechanics.* M. Ed., 1949, Wayne University. 77 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To describe twenty teaching aids designed for household mechanics.

Source of Data: Data were obtained from periodicals and the contributors of articles on teaching aids.

Findings and Conclusions: This study may be used as a source of reference when building an instructional program. Before a device is constructed its suitability, practicability, and attractiveness should be carefully considered.

1993. WELCH, HERBERT E. (M. S.). *The Development and Use of Motion Pictures for Teaching Difficult Areas in Drafting.* Oregon State College, 1940. 108 p.

An examination of drafting content at the high school and junior college levels, with recommendations for the objective presentation of certain difficult units of instruction by means of the motion picture. The correlation of the animated motion pictures with the best use of text and other teaching aids is discussed.

1994. WHITE, HAROLD S. *Teaching Aids For Industrial Arts Woodwork.* M. S., 1951, University of Tennessee. 43 p. Library, University of Tennessee, Knoxville.

Purpose: To show how the various teaching aids can be used in industrial arts woodwork classes.

Source of Data: Data were secured from books, trade journals, and professional magazines.

Findings and Conclusions: Among other things, the report contains a list of selected motion picture films and strip films, together with sources and costs. A bibliography of references on teaching aids is included.

1995. WILSON, NORA. *A Comparative Study of the Effectiveness of Two Ways of Presenting Vocational Information.* M. A., University of Michigan, 1932. 60 p.

The study shows how a refinement in the method of presenting vocational information may account for the greater absorption of the subject matter, and therefore the greater value of the course to the student.

1996. WITTICK, EUGENE C. (M. S.). *The Promotion of Thinking Habits in the Power Laboratory Course of the Chicago University High School.* Colorado Agricultural & Mechanical College, 1939. 100 p.

Suggested procedures for developing in pupils the power to think more clearly in doing their work and to provide experiences which will enable them to do their work more understandingly.

1997. WORLAND, CHARLES W. *A Comparative Investigation of Teaching One Ninth Grade Vocations Unit Based Primarily on Reading and Another Based on the Use of Audio Visual Aids.* M. A., 1950, University of Michigan. 61 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To compare the effectiveness of teaching methods to students who were taught a unit on vocations and occupations based primarily on reading with that of students who were taught such a unit based upon the use of audio-visual aids.

Source of Data: Students in the tenth grades were divided into two groups as suggested above, and were asked to fill out a questionnaire dealing with their ninth grade courses in vocations.

Findings and Conclusions: Effectiveness of teaching methods: Both groups showed a decided preference for activities involving the use of audio-visual aids. The dislikes of students reflected against the activities based on reading and favorable toward activities which offer a more direct learning experience to the student. Attitudes toward further study of vocations: About the same percentage of students were satisfied with what they had accomplished in the unit on vocations. Other attitudes as to time wasted and duration of the course, however, showed that the unit based on audio-visual aids was considered more favorable by the students. Retention of information: There was very little difference in the results of testing the two groups, and it was found that the retention of the activities carried on in the unit on vocation is very lasting—and this may be due to the great importance of this unit to the individual student. Student attitudes toward further study: The tests reveal that students are very serious while taking the unit on vocations, but their enthusiasm begins to lag as the immediacy of the problem at hand begins to pass. Specific recommendations both for further studies and curriculum-planning are made on the basis of these findings.

1998. WRIGHT, BOB H. (M. Ed.). *Photographic Presentations of the Lacquer-Finishing Process for Industrial Arts Projects.* Colorado Agricultural & Mechanical College, 1943. 95 p.

A study of the application and uses of lacquer in junior high school woodwork. The process of lacquer-finishing is presented in twelve operation sheets.

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1999. WRIGHT, WELCOME E. *Experimental Determination of the Value of the Mirror as an Aid in Demonstrating Operations in Industrial Arts.* Ed. D., 1953, The Pennsylvania State University. 150 p. Library, The

Pennsylvania State University, University Park.

Purpose: To ascertain whether the use of a mirror set-up as an aid in demonstrating operations in industrial arts will enable students to apply manipulative procedures more efficiently.

Source of Data: Data were obtained through an experimental study involving equivalent groups.

Findings and Conclusions: Analysis of class results indicates that students can see, understand, and apply the manipulative procedures of demonstrations more efficiently when a mirror arrangement is used as an aid in presenting certain demontrations in industrial arts. There is evidence that the mirror set-up is quite valuable when presenting demonstrations that are somewhat complicated and require detailed and precise hand activity.

2000. YOUNGBLOOD, MARY SUE (M. S.). *Creative Activity in Fine and Industrial Arts in the Lower Grades.* Oklahoma A & M College, 1933. 54 p.

A study of classroom activities in fine and industrial arts in the lower grades to discover techniques employed by teachers who are successful in stimulating and promoting creative responses.

2001. ZIEMKE, DONALD PAUL. *A Course of Study for the Second Year of Related Science in a Vocational High School with Recommended Teaching Aids.* M. S., 1950, University of Tennessee. 149 p. Library, University of Tennessee, Knoxville.

Purpose: To determine some of the more advanced units of related science common to a group of trades which could be offered in the second or possibly the third year of a vocational high school trade preparatory curriculum.

Source of Data: Material in the office of Clyde H. Wilson, Professor of Industrial Education, involving course outlines in 9 trades, together with more than 50 analyses from the Milwaukee Vocational School and the library at the University of Tennessee were used for basic data. The folders and catalogues of a number of vocational high schools were also consulted.

Findings and Conclusions: A course of study with suggestions for teachers in related science for the second and third year in vocational high schools was prepared. Four major areas were heat, electricity and magnetism, light, and lubrication. Under each of the major areas a series of unit lesson titles was listed. these in turn were checked as to their functioning value for use as related science content in 9 different trades. Certain basic information units were developed with instruction sheets and with a discussion of the teaching methods involved using demonstration, laboratory equipment, and visual aids.

2002. ZIMMERMAN, WALTER JOHN (M. Ed.). *Selection, Preparation and Use of Teaching Aids in Vocational Education.* University of Buffalo, 1949. 167 p.

A discussion of audio-visual aids including their advantages, disadvantages, and use. Sample types of instruction sheets that have been used as part of the industrial teacher training program in New York State are included.

Supervision

General

2003. BJORNSTAD, LLOYD B. (M. A.). *The Supervision of Industrial Education in the Public Schools of Minnesota.* University of Minnesota, 1932. 103 p.

A study, based on questionnaires to school superintendents, of the practices of small school systems regarding the supervision of industrial arts. Its purpose is to improve industrial instruction in smaller school systems.

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2004. BRANDON, GEORGE LOUIS. *An Appraisal of the Preparation of Industrial Education Supervisors in Ohio Colleges for Teacher Education.* Ph. D., 1952, The Ohio State University. 326 p. Library, The Ohio State University, Columbus.

Purpose: To analyze the preparation of industrial education supervisors taking graduate courses in Ohio colleges for teacher education and to appraise then the preparation in terms of functions which local supervisors actually perform and should perform in the judgment of specialists.

Source of Data: Data were obtained by a survey of educational literature, previous studies, and three check lists distributed to a nationwide jury of fifty teacher education-supervision specialists, local Ohio industrial education supervisors, and heads of industrial education departments in Ohio colleges for teacher education.

Findings and Conclusions: Preparation in present graduate industrial education courses is primarily intended for supervisory activities in the administraton of industrial education. Seventy per cent of all highest emphases instruction is directed toward the functions of administration. The supervisor's activities in in-servce education, utilization of group processes, and teacher education of beginning trade teachers are generally neglected or minimized in graduate courses. Course provisions are especially lacking for all of the supervisor's activities in education of beginning trade teachers and the in-service education of the staff.

2005. BUBOLTZ, HARRY P. (M. S.). *An Analysis of the Duties of the Supervisors of Industrial Arts in Michigan Cities Having a Population of Over 20,0000.* The Stout Institute, 1944. 131 p.

By means of a questionnaire survey of nineteen supervisors and seventy-nine principals, the author determined the relative importance and value of supervisory duties performed in industrial arts and the desirability of performing such duties.

2006. BUNKER, ALBION J. (M. S.). *An Evaluation of the Supervision of Industrial Arts in Nebraska.* The Stout Institute, 1941. 127 p.

An investigation through a questionnaire survey of ninety-eight industrial arts teachers in sixty-seven cities in Nebraska showed that industrial arts teachers believe that supervision is inadequate. Various plans for more effective supervision are suggested.

2007. CHRISTOPHERSON, CLARENCE H. (M. A.). *State Courses in the Industrial Arts.* University of Minnesota, 1933. 126 p.

An analytical study of policies and instruments for the promotion and supervision of industrial arts in twenty-five states, with special reference to the characteristics and uses of state courses of study or syllabi in this field.

2008. COBLE, CLAY CAUGHREN. *The Need for and Qualifications of an Industrial Arts State Supervisor in the Secondary Schools of Tennessee.* M. A., 1952, Middle Tennessee State College. 75 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the need for an industrial arts supervisor in the Tennessee State Department of Education, and the desired qualifications for same.

Source of Data: Data were secured through questionnaires, visitations in industrial arts shops of Tennessee, and from supervisors of industrial arts in eighteen states.

Findings and Conclusions: An industrial arts supervisor is needed in the Tennessee State Department of Education. He should have a Master's degree with a major in industrial education. He should have from eight to ten years of teaching experience. His most outstanding personal qualifications should be a pleasing personality and leadership ability. The chief value of the industrial arts supervisor is to unify the state program of industrial arts and to promote industrial arts on a state wide basis.

2009. DOWDALL, LEVEN M. *Evaluation of Student-Teaching Experiences in Industrial Arts.* M. S., 1952, Illinois State Normal University. 77 p. Library, Illinois State Normal University, Normal.

Purpose: To evaluate student-teaching experiences in industrial arts on the basis of the viewpoints of forty-five supervising teachers and thirty-eight student teachers in Illinois.

Source of Data: Data were obtained from questionnaires sent to supervising teachers and thirty-eight student teachers in Illinois.

Findings and Conclusions: Findings of the study are reported in terms of importance of experiences and in terms of frequency of use of experiences.

2010. DUNLOP, WILLIAM J. *State Supervision of Industrial Arts in Washington.* M. S., 1950, Oregon State College. 61 p. Oregon State College, Corvallis.

Purpose: To contrast the development of industrial arts in the State of Washington against the development of industrial arts programs in Connecticut and Missouri.

Source of Data: Comparative analysis of programs in 3 States.

Findings and Conclusions: Significant differences were found between the program of industrial arts in Washington and the program in States utilizing State supervision of industrial arts. The State of Washington can justify the employment of a full time State Supervisor of Industrial Arts.

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2011. EISENBERG, WILLIAM L. (Ed.D.), *Supervisors' Evaluations of the Qualities Essential to Their Positions.* Temple University, 1947. 140 p.

Eight hundred and seventy-four supervisors employed in fifty-two different organizations were asked to rank twenty-five qualities needed by co-ordinating supervisors and front-line supervisors.

2012. ERICKSON, ALFRED C. (M.Ed.), *Duties and Responsibilities of Local Supervisors of Vocational Trade and Industrial Education.* Colorado Agricultural & Mechanical College, 1941. 130 p.

A cross-sectional view of the duties and responsibilities of local supervisors. Information was obtained from seventy supervisors.

2013. FINTZ, JOHN EDWARD (M.A.). *The Problem of Centralized Supervision in Industrial Arts with Special Reference to the Preparation of Instructional Material.* The Ohio State University, 1933.

An investigation of the objectives of industrial arts in the junior high school as recognized in Cleveland, Ohio. It considers the factors necessary for acceptable and effective teacher supervision.

2014. GALLIPO, ROY MILTON. *A Survey of What is Being Done by Administrators and Supervisors to Upgrade Teachers Now in Service in Michigan Secondary Vocational Schools.* M.A., University of Michigan, 1947. 39 p.

A survey in the field of trade and industrial education to determine what methods were being used by administrators and supervisors to upgrade teachers in service. A suggested list of methods was prepared and evaluated.

2015. GEHRIG, CLARENCE ALFRED (M.A.). *Self-Rating Versus Supervisor Rating of Industrial Arts Teachers Compared with Similar Ratings of Academic Subject Teachers in Holmes County.* Ohio State University, 1934. 101 p.

A study of teachers from grades six to twelve in Holmes County to develop rating systems and discover the practicability and feasibility of a self-rating system for industrial arts teachers. It attempts to improve instruction and supervision of industrial arts.

2016. GERHART, ROBERT L. *Services Desired by the Industrial Arts Teachers of Texas from the State Consultant of Industrial Arts.* M. Ed., 1952, Agricultural and Mechanical College of Texas. 54 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To discover the services desired by the industrial arts teachers of Texas from the State Consultant for industrial arts.

Source of Data: Data were obtained from books, periodicals, unpublished materials, and personal correspondence.

Findings and Conclusions: Industrial arts teachers of Texas are interested in the subject of state supervision. These teachers desire to have an opportunity to share their ideas, teaching techniques, and methods with each other through their consultant.

2017. GRAINGE, FLOYD MARVIN. *Survey of Methods Used in Supervision of Student Teaching.* M. S., 1953, Iowa State College. 84 p. Library, Iowa State College, Ames.

Purpose: To ascertain and evaluate the techniques being used by supervisory teachers; to evaluate the experiences of graduates of Iowa State College, and to make certain recommendations concerning student teaching.

Source of Data: Data were obtained from questionnaires sent to 35 teachers within a 45 mile radius of Ames and to 153 graduates who had completed their student teaching.

Findings and Conclusions: Twenty recommendations for both the supervisory teacher and the student teacher are presented as ways in which to maximize the benefits of student teaching.

2018. HANKISON, J. RUDOLPH (M. A.). *A Check List for the Use of Administrators in the Supervision of Industrial Arts.* Ohio University, 1937. 74 p.

The compilation of a list of items which tend to reflect the characteristics of a desirable industrial arts program. These items are classified and interpreted to serve as a check list to survey industrial art programs.

2019. HAULER, ARTHUR (M. S.). *A Scientific and Creative Plan of Procedure For Inductive Observation of Teaching as Carried on in Industrial Arts Teacher Education.* Syracuse University, 1936. 80 p.

An investigation of the plans in use for observation of teaching as a part of supervised student teaching.

2020. HIMELICK, ALFRED A. (M. S.). *The Duties of a Director, Supervisor, and Co-ordinator of Industrial Education in the State of Indiana.* The Stout Institute, 1947. 99 p.

Allocates, according to practice and preference, a comprehensive list of duties performed by directors, supervisors, and co-ordinators of industrial education. The report is based on a survey of thirty-eight directors, supervisors, and co-ordinators.

2021. HOOLE, ROBERT S. (M. Ed.). *Duties and Opportunities of the Industrial High School Principal.* University of Buffalo, 1940. 62 p.

An analysis of the duties and responsibilities of the principal of an industrial high school. Data is based on the literature in the field.

2022. JACKSON, THOMAS ALTON. *A Study of the Preparation and In-Service Training of Negro Trade and Industrial Education Teachers in Tennessee.* M. S., 1953, Tennessee Agricultural and Industrial State University. 86 p. Library, Tennessee Agricultural and Industrial State University, Nashville.

Purpose: To ascertain the educational status of Negro trade teachers of Tennessee, and to ascertain and evaluate the supervisory services available to them in the light of expressed needs.

Source of Data: Data were obtained through questionnaires from Negro trade teachers in the state and from district supervisors of the Tennessee trade and industrial education staff.

Findings and Conclusions: Of the thirty Negro trade teachers studied, five held Master's degrees, ten held Bachelor's degrees, and fifteen held no degrees. Ninety per cent of the trade teachers met the minimum education requirements as set forth in the Tennessee State Plan.

2023. KITTLESON, CHARLES A. (M. S.). *Supervisor's Observation Blank for Evaluating the Teaching of Industrial Arts Subjects.* The Stout Institute, 1941. 47 p.

The author develops a teacher rating observation form based on the opinions of industrial arts supervisors of systems with at least three industrial arts teachers in Illinois, Wisconsin, Minnesota, and Ohio.

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2024. LESTER, SEELIG LESTER (Ed. D.). *A Manual for Use in Supervision of Vocational Industrial Education.* New York University School of Education, 1944. 292 p.

A series of operating procedures for supervisors in the field of vocational and industrial education. The conclusions are validated by the jury method.

2025. LLOYD, WALTER W. *A Study of In-Service Teacher Training in Industrial Arts.* M. S., 1951, Bowling Green State University. 64 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To examine and evaluate the in-service training program for industrial arts teachers.

Source of Data: Data were secured by questionnaires from a jury of specialists in in-service training, supervisors of industrial arts, and high school principals.

Findings and Conclusions: There is very little agreement as to the functions of in-service teacher training that are most desirable. There was agreement on what functions were least desirable. Supervisors of industrial arts did not agree with principals on the importance of the functions.

2026. LUDEMAN, KARL FREDERICK (M. Ed.). *Present Practices, Supervisory Procedures and Supervisory Organizations in Industrial Arts in Second and Third Class Cities in Wisconsin.* Marquette University, 1939. 111 p.

A study of procedures and supervisory practices in industrial arts, with emphasis on the qualifications of the teaching personnel, the educational objectives, the development of subject matter and current teaching procedures.

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2027. MICHEELS, WILLIAM J. (Ph. D.). *State Supervision of Industrial Arts Education.* University of Minnesota, 1941. 326 p.

A comparative survey of practices and procedures in the areas of state supervision for industrial arts education. A jury of experts, the various state supervisors, and 353 industrial arts teachers reacted to 153 different practices which are followed or should be followed. Suggestions are made for the improvement of supervisory service to the industrial arts teachers in any state.

2028. MONEY, HOMER E. (M. S.). *To Determine if the Industrial Arts Teacher of Texas Needs or Wants State-Wide Industrial Arts Supervision.* North Texas State College, 1947. 66 p.

A survey of opinions of industrial arts teachers of Texas in 1947 as to the need for state supervision. The study makes a case for a qualified state supervisor of industrial arts with a set-up that would help in the improvement of instruction and the development of the work.

2029. NALBACH, WALTER B. (M. A.). *Present Practices and Methods of Supervising Teachers in Industrial Arts.* Western Kentucky State College, 1936.

An analysis of variations and a description of central tendencies in the technique of supervising student teachers in an effort to ascertain a means of evaluating student teaching in industrial arts.

2030. REED, JOE L. *A Comparative Study of the Plans of State Supervisors for Trade and Industrial Education in the United States and Territory of the Southern Region.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 109 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To analyze and compare the various plans for supervising trade and industrial education in the several States and Territory of the Southern region and to suggest ways and means of utilizing the findings.

Source of Date: Examination of books, Federal and State bulletins, current magazine articles, and Federal Reports; interviews and conferences with State supervisors, teacher trainers, vocational teachers, local directors, and coordinators.

Findings and Conclusions: Little has been done on a regional or national scale in compiling and analyzing materials dealing with supervisory practices and responsibilities. A diversity of concepts were found to exist as to specific duties and responsibilities of supervisors. There is great variation in the various State plans regarding the trade experience, general and professional education, and other qualifications. All States require some form of temporary certificate, but many States make no further provision for advanced certificates. Inspection and evaluation procedures vary greatly throughout the States.

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2031. SCHORLING, HORACE OREN. *Survey of Industrial Arts Supervision in Selected States.* Ed. D., 1950, Oregon State College. 175 p. Library, Oregon State College, Corvallis.

Purpose: To study State and local supervision of industrial arts, as it relates to: Training, experiences, policies, and procedures of supervisory personnel.

Source of Data: Statistical, analytical, and descriptive techniques were used to illustrate the training and experience of supervisory personnel—both local and State.

Findings and Conclusions: A need exists for expansion and improvement of supervision. Special industrial arts supervisors provide better services more consistently than do general or T. & I. supervisors. Staff assistants are needed. And there is a need for clearer statements of the substance and procedure of supervision.

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2032. SCHOTT, WILLIAM JOSEPH. *The Development of a Plan for Supervisor-Teacher Coordination in the Preparation of Instructional Materials for Vocational-Industrial Courses of Less than College Grade.* Ed. D., 1954, New York University. 407 p. Library, New York University, New York.*

Purpose: To develop a plan whereby state and city supervisors can work with teachers in the field for the improvement of instruction in trade subjects in terms of skills.

Source of Data: The data were obtained from selected bibliographies, minutes of committee meetings which were comprised of teachers, craft advisory groups, administrative staff, and observations of the school shops and instructional materials.

Findings and Conclusions: Learning should be organized on a unitary basis rather than on a series of operations. Flexible shop subject curricula can be developed from published instructional materials. The people who are to use the materials in teaching are the ones who, with guidance, can best plan the curriculum.

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2033. SECHREST, CHARLES H. *The Supervision of Industrial Arts: Effective Practices for Selected Major Problems.* Ed. D., 1953, Wayne University. 228 p. Department of Industrial Education, Wayne, University, Detroit, Mich.

Purpose: To assemble a list of major problems in the supervision of industrial arts, identify those which were common, select those judged to be most pressing, and search for and report practices judged to be effective.

Source of Data: Data were obtained by personal interviews with supervisors, teachers, graduate students, and faculty members of the Industrial Teacher Education Department of Wayne University. Other problems were suggested by letters and by literature pertaining to the supervision of industrial arts.

Findings and Conclusions: The supervisor of industrial arts should establish a program for upgrading in-service teachers, maintain morale, encourage professional attitudes, and establish effective techniques for improving the instructional program. They should also help teachers prepare curriculum materials and acquaint administrators, parents, and others with an understanding of industrial arts.

2034. SIRO, EINAR E. *The Industrial Arts Education Supervisor.* M. A., University of Minnesota, 1936. 83 p.

A canvass of the literature on the position known as industrial arts supervisor—qualifications, discussion of responsibilities, immediate duties and present status.

2035. STERRETT, ROY S. *Activities of the Supervising Teacher of Industrial Arts Student Teachers in South Dakota.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 57 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the duties and responsibilities of the supervising teachers of industrial arts student teachers.

Source of Data: A questionnaire was developed based on the need for supervision on the part of the student. A second questionnaire based on the activities of the supervising teacher was also developed.

Findings and Conclusions: Educators and student teachers are in accord on these points: A certain period must be allowed the student to acquaint himself with the teaching situation. He should first teach under supervision. Less and less supervision should be provided as he develops in his teaching. All teachers in the system should accept him as a member of the staff.

2036. STILES, HAROLD LEANDER (M. S.). *A Study of Industrial Arts Supervision in Schools Not Employing Special Supervisors.* Oregon State College, 1938. 61 p.

A study of the general supervision of industrial arts in the small schools of Arizona not employing a state supervisor of industrial arts, as compared with specialized and general supervision elsewhere.

2037. TIMBERS, M. H. (M. S.). *A Study of the Supervisory Responsibilities of Departmental Heads for Industrial Arts Departments in Cities of a Population between 250,000 and 500,000.* The Stout Institute, 1940. 64 p.

In accord with the replies of twenty-five department heads in industrial arts departments of ten cities, the writer develops a table of duties for industrial arts department heads which may serve as a guide for up-grading the teaching of industrial arts.

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2038. WALKER, LLOYD R. (Ed. D.). *Relative Effectiveness of Four Supervisory Training Methods in the Automotive Industry.* Temple University, 1946. 258 p.

A comparison of five methods of training supervisors: (1) directed conference, (2) case study, (3) lecture and discussion, (4) symposium, (5) combination.

Coordination

2039. ANDERSON, WALTER F. *The Coordination in Minnesota.* M. A., University of Minnesota, 1939 94 p.

A survey to describe and appraise the work of the vocational education coordinator—qualifications, responsibilities, procedures, and problems.

2040. **BOWLER, EARL M. (M. S.).** *The Improvement of Vocational Co-Ordination in the City of Rhinelander, Wisconsin, through a Comparative Study of the Programs of other Wisconsin Cities and of the Needs of which Rhinelander Vocational School should be Adjusted.* Colorado Agricultural and Mechanical College, 1938. 86 p.

A program of the duties, responsibilities, procedures, methods, and devices recommended for use by the co-ordination of the school.

2041. **DE STEFANO, ERNEST JOSEPH.** *A Program for the Coordination of Industrial Arts Personnel in the Pittsburg, California, City School District.* M. S., 1953., Oregon State College. 60 p. Library, Oregon State College, Corvallis.

Purpose: To examine the possibilities and values of coordinating the personnel and programs of independent school shops of Pittsburg, California, Public Schools.

Source of Data: Data were obtained from school records and personnel.

Findings and Conclusions: Correlation of the industrial arts program has resulted in support from the administration, consolidation of interest, effort, and objectives of both teachers and administration, and improved leadership in industrial arts.

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2042. **KOHRMAN, GEORGE E.** *An Analysis of the Activities, Training, and Opinions of Coordinators of Cooperative Education.* Ed. D., 1952, University of Missouri. 214 p. Library, University of Missouri, Columbia.*

Purpose: To analyze the activities, training, and opinions of coordinators of cooperative part-time vocational education and to ascertain what implications, if any, such activities, training, and opinions might have for the improvement of the professonal education of teacher-coordinators.

Source of Data: Data for the study were gathered through information forms sent to 342 business education coordinators and 460 industrial education coordinators designated by their state supervisors. Forty-two states and territories of Hawaii and Puerto Rico were represented in the survey, with a 60 per cent return.

Findings and Conclusions: The duties, responsibilities, and activities of coordinators of cooperative programs in business occupations are similar to the duties, responsibilities, and activities of coordinators of cooperative programs in industrial occupations except in the area of occupational analysis. Business and industrial coordinators hold similar opinions as to the importance of the activities which they perform in the organization and operation of cooperative programs. They likewise hold similar opinions as to the training needed in order to perform the various activities involved in the coordinator's job. Both groups believe that teacher-education institutions should provide instruction in the performance of these activities. Business coordinators and industrial coordinators need essentially the same type of pre-employment and in-service vocational professional education. Both groups need more training in the area of public speaking, public relations and vocational guidance.

2043. **LAMOND, JAMES J. (M. Ed.).** *Coordination in Vocational Schools.* Temple University, 1930. 144 p.

A description of the functions and services of vocational schools in Philadelphia in 1930. It considers the aims and philosophy of the schools as well as the extent to which these schools meet the needs of the students.

2044. **McENROE, PAT J., Jr.** *Coordinating an Industrial Education Curriculum at the Victoria College with the Four Year College in Texas.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 43 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To organize an industrial education program for Victoria Junior College that will meet the entrance requirements of four-year colleges.

Source of Data: Data were secured from books, periodicals, bulletins, and catalogs.

Findings and Conclusions: The junior college is handicapped in course offerings because, in order to draw state aid, its courses must parallel those offered in state supported senior colleges. In order to eliminate the difficulty in transferring credits, it is believed that the Associate of Arts Degree should be given.

2045. **MORAN, JOHN F. (Masters).** *A Study of the Possibilities of Cooperation between the General Electric Company and the Pittsfield School Department in the Improvement of the Present Program of Vocational Education.* Massachusetts State College, 1938.

2046. NICHOLSON, SAMUEL W. (Masters). *A Proposed Program of Cooperative Vocational Education for Spartanburg, South Carolina.* University of South Carolina, 1936.

2047. PIERSON, THEODORE K. *A Plan of Co-ordination in Minnesota.* M. S., University of Minnesota, 1947. 129 p.

A study to determine the duties of the coordinator in part-time programs in order to improve the present program.

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2048. SHIBLER, HERMAN L. (Doctors). *Co-operative Vocational Education in the Public High School.* Ohio State University, 1941.

Evaluation

2049. ANDERSON, JACK R. *Trade and Industrial Education Program of the Phoenix Technical School, Phoenix, Arizona.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 85 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the effectiveness of the trade and industrial education program of the Phoenix Technical School in meeting the needs of the community.

Source of Data: Data were obtained by an analytical review of statistics and records pertinent to the study.

Findings and Conclusions: Job opportunities in the field of trade and industrial education in the community were excellent. There was a definite lack of correlation between school training offered and employers' needs. There is a need for a change in the basic philosophy of the school as an educational unit of the community.

2050. BARNES, KENNETH W. *Evaluation of Vocational Machine Shop Course at Lansing, Michigan.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 75 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To find to what extent the vocational machine shop course met the needs of those students who have graduated from the machine shop course.

Source of Data: Review of literature, personal interview and check sheet of graduates and employers of graduates. The report covered 68 graduates from 1942 to 1949.

Findings and Conclusions: Sixty-five percent of machine shop graduates were following the occupations they were trained for. Twenty-two percent of the graduates have entered the various machine shop apprenticeships, and thirty-eight percent of the graduates were at highly skilled or skilled machine shop work. The employed students had the respect of the employers and fellow workers. The basic machine shop training helped them get and hold their jobs.

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2051. BATESON, WILLARD M. *The Determination of Standards for Industrial-Arts Laboratories.* Ph. D., 1954, University of Michigan. 230 p. Library, University of Michigan, Ann Arbor.*

Purpose: To develop a check list of standards for use by teachers and others in evaluating the physical facilities in the industrial arts laboratory.

Source of Data: Data were obtained by an analysis of literature pertaining to the standards for industrial arts laboratories. These were then submitted to a jury of industrial arts specialists for consideration.

Findings and Conclusions: The work of the study resulted in a thirty page check list of standards for use in evaluating the physical facilities of the industrial arts laboratory.

2052. BENSON, HERBERT L. (M. Ed.). *A Method of Evaluating the Grand Junction, Colorado, Trade and Industrial Program.* Colorado Agricultural & Mechanical College, 1946. 98 p.

A guide for determining the extent to which the program in 1946 was meeting the needs in buildings, equipment, courses, and personnel.

2053. BIRTA, NICHOLAS. *An Evaluation of Four Aspects of Training Received by the Aviation Mechanic Graduates at the Aero Mechanic Vocational High School.* M. Ed., 1954, Wayne University. 87 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the number of graduates working in the fields for which they were trained, whether the graduates felt they had received sufficient theory and shop practice, if they felt the equipment and materials were out-of-date, and to develop recommendations for revising the course of study.

Source of Data: Data were obtained from a detailed investigation of pertinent literature and research studies. A survey questionnaire was sent to all graduates of the school who could be reached and who had achieved ratings in the field since 1946.

Findings and Conclusions: It was recommended that the study be used as a basis for further curriculum revisions and investigations, and that specific findings be considered if a re-allocation of time allotments is contemplated in relation to classroom and shop subjects in the present curriculum.

2054. BLANTON, EARLE B. *An Evaluation of the Teaching Loads of Teachers in the High Schools of Texas.* M. S., North Texas State College, 1944. 64 p.

An evaluation of the teaching load of teachers of vocational education compared with teachers of other subjects in selected Texas high schools.

2055. BOONE, LEO E. *Criteria For The Evaluation Of A Program Of Industrial Arts For The Public Junior Colleges of Kansas.* M. S., 1953, Kansas State Teachers College. 89 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To set up a method of evaluating industrial arts programs in the Kansas Public Junior Colleges.

Source of Data: Data were obtained from literature on the development, purpose, and functions of junior colleges, Kansas public junior college bulletins, a study of trends in the field, and a consideration of organizational effectiveness, physical facilities, and instructional practices.

Findings and Conclusions: Nature and extent of industrial arts in the public junior colleges in Kansas is given. Seven evaluative criteria were developed.

2056. BOWERS, VICTOR LEE (M. A.). *Evaluation of an Industrial Arts Conference.* Ohio State University, 1937. 151 p.

An analytical description of the August 22, 1936 Conference on School-Shop Planning and Equipment Selection, held at Columbus, Ohio. An attempt is made to evaluate all phases of the conference.

2057. BRISCOE, HATTIE RUTH ELAM. *Factors Involved in Student Failure at Texas State Board of Hairdressers and Cosmetologists.* M. S., 1951, Prairie View Agricultural and Mechanical College. 78 p. Library, Prairie View Agricultural and Mechanical College, Prairie View, Tex.

Purpose: To ascertain the factors involved in students failure at the Texas Board of Hairdressers and Cosmetologists.

Source of Data: Data were secured from similar studies, students records, and type of questions most frequently missed.

Findings and Conclusions: Age, educational status, and marital status, written and oral examinations were factors that contributed to the students' failure at Texas State Board of Hairdressers.

2058. CHADWICK, RICHARD J. *An Evaluation of the Industrial Education Program of the Fort Dodge High School Based Upon a Survey of the Male Graduates of 1946–1949.* M. S., 1954, Iowa State College. 47 p. Library, Iowa State College, Ames.

Purpose: To learn the extent to which the industrial education in the Fort Dodge High School has met the needs and interests of the graduates, the need for the addition of more areas of training, and why students do or do not enroll in these courses.

Source of Data: Data were collected by a questionnaire sent to the male graduates of 1946 thru 1949.

Findings and Conclusions: Thirty-one per cent of those responding indicated that they did not take industrial education in high school. Fifty-three per cent of this group now think industrial education would have been of benefit to them. Industrial education graduates reported such courses as woodwork, metalwork architectural and mechanical drawing to be of value to them in their present occupation. The non-industrial education graduates reported that electricity and auto mechanics would have been of value to them. There is need for the addition of other areas of training. Graduates place much value on such courses as electricity, auto mechanics, welding, carpentry, and radio repair as related to their present occupation and to such activities as hobbies and home repair.

2059. CHARIN, WILLIAM SPENCER. *Proposed Methods and Techniques for Evaluating the Effectiveness of Training Programs.* M. P. S., University of Colorado, 1948.

A suggested program of methods and techniques for evaluating training programs.

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2060. CHATFIELD, WILLIAM D. *An Evaluation of the Curriculum for Industrial Arts Teacher Education In Connecticut.* Ph. D., 1955, University of Connecticut. 171 p. Library, University of Connecticut, Storrs.*

Purpose: To develop recommendations to improve the industrial arts teacher education curriculum at the Teachers College of Connecticut.

Source of Data: Data were obtained from 90 teachers of industrial arts who were graduated from the Teachers College of Connecticut between the years 1947 and 1952 inclusive. Additional data were obtained from 30 supervisors of industrial arts, secondary school principals, and industrial arts teacher trainers.

Findings and Conclusions: A majority of the graduates were satisfied with over half of their undergraduate curricular experiences. Twenty curricular experiences which were declared essential to the curriculum by the supervisors were rated as in need of enrichment by the teachers: methods of storing projects and supplies; power distribution in a shop; ordering tools, supplies, and equipment, understanding industrial methods; selecting reference materials; studying occupational information; better understanding of individual differences; helping students adapt to the community; student-teacher planning; development of evaluation plans; techniques of using group dynamics and correlating work with other departments; drafting; designing; chalkboard techniques; guidance; audio-visual materials; physics; shop mathematics; and freehand sketching.

2061. DAY, OMAR H. (Masters). *An Evaluation of Certain Summer Session Courses at Colorado Agricultural College for Training Industrial Arts Teachers Based on an Analysis of Teaching Jobs.* Colorado Agricultural and Mechanical College, 1935.

2062. FAGAN, RAYMOND E. B. (M.A.). *The Defense Courses of Colorado in Relation to the Defense Industries.* Colorado State College of Education, 1942. 186 p.

An evaluation of the defense courses of Colorado in terms of placement of defense course trainees in defense industries covering the period 1940–1942. Schools, courses, trainees, and employing industries were studied along with co-operating selective service selectees.

2063. FILLEY, HUBERT B. (Masters). *An Evaluation of the Stratton High School Vocational Program for Boys.* University of Nebraska, 1942.

2064. FRAZIER, GOLAN SAMSON. *An Evaluation of the Existing Industrial Arts Program in the City Schools of Durham, North Carolina—1953-1954.* M. S., 1954, Agricultural and Technical College of North Carolina. 120 p. Library, Agricultural and Technical College of North Carolina, Greensboro.

Purpose: To evaluate the industrial arts program of the city school system and to suggest necessary revisions, additions or substitutions in order to keep the program abreast of the times.

Source of Data: Data were secured by a check-list, interviews, and recommendations of authorities.

Findings and Conclusions: The industrial arts program is not broad enough. Only the eighth grade and junior students receive such instruction. The forty-five minute periods are too short. Class size and the variety of instructional areas are satisfactory.

2065. GARRITY, THOMAS PHILIP. *A Study of Smith-Hughes Graduates in the Junior High Schools of a Metropolitan City.* M. A., University of Michigan, 1934. 31 p.

A study attempting to evaluate the Smith-Hughes program in a certain city in terms of the success of its graduates; taking into account, however, social, economic, and psychological factors affecting the subjects under consideration.

2066. HALL, HENRY OSBORN. *An Evaluation of the Mobile Shop Program of Kern County.* M. S., 1954, Oregon State College. 63 p. Library, Oregon State College, Corvallis.

Purpose: To evaluate the educational benefits derived from the mobile shop program of Kern County, California.

Source of Data: Data were obtained through the use of a pre-test and a follow-up test given at the end of one year.

Findings and Conclusions: The mobile shop program is a suitable method of providing programs of industrial arts for rural communities. Student achievement is cumulative for at least three years.

2067. HANCOX, EZELLE HAYWOOD (M. A.). *An Attempt to Measure the Adequacy of the Preparation of the Graduates of the Blaine High School of Perry, Oklahoma, to Meet the Requirements of Vocations Which They are Following.* Colorado State College of Education, 1941. 79 p.

A survey of evaluate the present vocational education program of Blaine High School, Perry, Oklahoma. A list of potential jobs and job requirements was obtained from employers for setting up a new program.

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2068. HARRISON, ELTON C. *An Evaluation of Industrial Educational Programs in Secondary Schools for Negroes in Louisiana.* Ph. D., 1948, Ohio State University. 314 p. Education Library, Ohio State University, Columbus.

Purpose: To examine the industrial education programs in high schools for Negroes in Louisiana to ascertain objectives and goals, effectiveness of the instruction and adequacy of facilities.

Source of Data: The development of a philosophy of education, formulation of criteria, a survey of twenty-one Louisiana programs, observation of nineteen programs and interviews with principals and teachers to gain information on philosophy and objectives.

Findings and Conclusions: The individuals responsible for planning the industrial education programs for Negroes in Louisiana need to re-think and re-examine their concepts of industrial education; to evaluate the existing programs; to develop better qualified teachers and to develop a spirit of group planning. A college study group of representatives of teacher education programs should give attention to the evaluation of local programs and teacher education programs. Local study groups should be created to study critically their respective industrial education programs.

2069. HEATH, EARL DAVIS. *Evaluation of Personal-Social Development in Industrial Arts Education.* M. A., 1950, University of Maryland. 123 p. Library, University of Maryland, College Park.

Purpose: To direct attention to appraisal techniques which are felt applicable to industrial arts teaching situations in the development of more desirable personal-social relationships within the school shop.

Source of Data: A survey of educational literature was made to discover evaluation devices and techniques for measuring development of attitudes and personal and social maturity. Evaluation devices and techniques were then developed which would be applicable to the industrial arts field.

Findings and Conclusions: In addition to the conventional tests and scales, the study suggests the use of evaluation instruments such as anecdotal records, data from pupil questionnaires, diaries of pupils, and teachers' records, records of observations by teachers and pupils, and check lists. The study lists the following steps in the development of an evaluation program: Clearly defining the objectives which are socially derived and which are compatible with present understandings of human growth and development; specifying the observable behavior changes which would indicate progress toward the attainment of the objectives; creating the situations where such behavior changes may be observed; recording in the most effective manner possible by varied media the results achieved to serve diagnostic purposes and give increasingly effective direction to the instruction.

2070. HIRTLE, STANLEY W. (Masters). *An Evaluation of the Character and Guidance Functions of the General Shop in the Junior High School.* Boston University, 1933. 164 p.

2071. HOFFMAN, FRED J. *An Evaluation of the Columbus Boys' Trade School.* M. A., 1950, The Ohio State University. 138 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain whether or not the Boys' Trade School is meeting the real needs of the students and if the school can be justified in continuing its present program of instruction.

Source of Data: Data were secured by a series of questionnaires sent to students and former students. The Ten Imperative Needs of Youth formed the basic criteria of the questionnaires.

Findings and Conclusions: The results indicated certain strengths and weaknesses in the program but in general the school appeared to be meeting the needs of the student body in a highly acceptable manner in terms of the criteria employed.

2072. JACKSON, ERVIN W. (M. A.). *An Evaluation of Industrial Arts Education in the Elementary Schools of Peoria, Illinois.* **Colorado State College of Education, 1941. 144 p.**

An evaluation of the elementary school industrial arts program of Peoria, Illinois, by pupils, parents, and the industrial arts teachers. Attention is given to course content and teaching methods.

2073. KRAUSE, HENRY W. *An Analysis and Evaluation of Industrial Arts Projects Used in Midwestern Ohio.* **M. A., 1950, University of Michigan. 153 p. Library, University of Michigan, Ann Arbor.**

Purpose: To prepare a list of the projects for industrial arts which are considered valuable for use at the secondary school level.

Source of Data: Data were obtained by letters sent to 270 instructors of industrial arts in midwestern Ohio, requesting drawings of projects used. These were evaluated by a committee of specialists.

Findings and Conclusions: Among the projects adjudged of value the greatest number were from woodworking with machine shop projects second and forge and foundry third. Other areas represented were art metal, plastics, sheet metal, and electricity. There seemed to be no standardized form in use with respect to drawings of the projects.

2074. LYNCH, ROBERT BRUCE. *The Industrial Arts Program in the Charleston, South Carolina, Public Schools With Recommendations.* **M. S., 1951, University of Tennessee. 83 p. Library, University of Tennessee, Knoxville.**

Purpose: To examine and evaluate the industrial arts program in Charleston, South Carolina.

Source of Data: Data were secured by a questionnaire sent to each industrial arts teacher.

Findings and Conclusions: The schools of Charleston, South Carolina, are not offering sufficient variety of industrial arts experiences. Floor space is limited, machines are insufficient, hand tools are inadequate, and shops are poorly planned. The units in general shop which appear to be most functional are: metalwork, home mechanics, mechanical drawing, simple electrical repairs, and woodworking.

2075. MARTIN, WAYNE STEPHEN (M. S.). *An Evaluation of Industrial Arts Programs in Oregon High Schools in Terms of Nationally Accepted Objectives.* **Oregon State College, 1948. 79 p.**

A study based on comparative ratings of nine objectives of industrial arts with respect to emphasis and achievement in Oregon schools. Diversity of practices and opinion leads to recommendations concerning the co-ordination of agencies which affect industrial arts training.

2076. MC CULLOUGH, JOHN A. *A Review and Evaluation of the Diversified Occupations Program in Greencastle, Indiana.* **M. S., 1953, Purdue University. 20 p. Library, Purdue University, Lafayette, Ind.**

Purpose: To review and record the development of the diversified occupations program in Greencastle, and to ascertain the extent to which the program is achieving its objectives.

Source of Data: Data were obtained by an examination of high school records, by personal interviews with selected individuals in the community and through the use of a reaction survey of teachers and students.

Findings and Conclusions: A favorable reaction to the D. O. program was found among students, teachers, school administrators, employers and citizens. All of the opportunities for cooperative education are not being used by the Greencastle school system. However, this type of educational program has served to broaden the training opportunities in the community. Since no scheduling difficulties were apparent, the program should be expanded to the limits available in the community.

2077. McGINNIS, ROBERT SIDNEY (M. A.). *An Evaluation of the Industrial Curriculum of the City Public Schools of Greeley, Colorado.* **Colorado State College of Education, 1932. 118 p.**

An evaluation of the public school vocational program in terms of needs of employees and employers and present offerings.

2078. McWATT, GEORGE D. *Construction of Evaluation Check Lists for Industrial Arts Programs.* **M. Ed., 1950, Wayne University. 40 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To develop ten check lists to help teachers and administrators evaluate industrial arts programs.

Source of Data: Data were obtained from the book entitled, Instructional Units for Professional Courses in Undergraduate Industrial Arts Teacher Education.

Findings and Conclusions: Evaluation is a method for improving instruction and hence learning. One check list at a time should be used; and when weaknesses have been found, they should be worked out. These check lists should not be used as a means of classifying teachers, but of helping them.

2079. MEUWISSEN, ARTHUR T. *An Approach to Evaluating the Objectives of a Junior High School Industrial Arts Woodworking Class.* M. A., 1951, University of Minnesota. 66 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop devices and techniques to measure attainment of objectives of a junior high school woodworking class.

Source of Data: Data were obtained by the experimental method.

Findings and Conclusions: Educational achievement can not be measured entirely by objective measures.

2080. MEYER, HARVEY M. (M. A.). *An Evaluation of the Industrial Arts Curriculum of the Denver, Colorado, Public Schools.* Colorado State College of Education, 1935, 98 p.

An investigation to evaluate the industrial arts curriculum of the Denver, Colorado, public schools in comparison with various other secondary school curricula in cities of 100,000 population or more.

2081. MICHAEL, WILLIAM BURTON (M. S.). *A Partial Appraisal of the Effectiveness of the E. S. M. W. T. Program in the Vocational Training of Employees.* University of Southern California, 1944, 125 p.

A study attempting to show the effectiveness of E. S. M. W. T. programs offered for aircraft employees from 1940–1945. It shows correlation for all tests given and draws conclusions from questionnaires to employees completing courses.

2082. MILNER, RALPH. *A Study of Industrial Arts With Reference to the Booker T. Washington High School. Shreveport, Louisiana.* M. A., 1953, The Ohio State University. 94 p. Library, The Ohio State University, Columbus.

Purpose: To evaluate the industrial arts program at the Booker T. Washington High School in the light of modern educational philosophy and practices.

Source of Data: Data were obtained by examining the present course offerings and requirements and from a questionnaire used to record the reactions of students to the courses of study which they were currently pursuing.

Findings and Conclusions: Much training in industrial education was offered but only a small percentage was classified as "trades". The writer concluded that a reorganization of the curriculum was needed to better prepare students to enter their present day industrial environment.

2083. MITCHELL, W. DEE, (M. S.). *Criteria for Evaluating an Industrial Arts Department.* Oklahoma A & M College, 1940. 98 p.

A survey to establish criteria for evaluating an industrial arts department.

2084. MOELLER, CARL A. *An Evaluation of the Crafts Program at the Memorial Student Center, Agricultural and Mechanical College of Texas.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 95 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the extent to which the program is attaining the goals proposed.

Source of Data: Data were obtained from books, periodicals, bulletins, and from an analysis of activities.

Findings and Conclusions: The crafts program has been successful in furnishing an avenue of relaxation and use of leisure time. Opinions indicate a strong desire for a larger working space and greater student participation.

2085. NICHOLSON, FRED SAMUEL. *An Evaluation of the Training Program of the Henry Ford Trade School, Dearborn, Michigan.* M. S., 1950, Wayne University. 91 p. Library, Wayne University, Detroit, Mich.

Purpose: To determine and evaluate the factors responsible for the apparent success of the Henry Ford Trade School.

Source of Data: Personal interviews with early graduates and former instructors including its former superintendent, Fred E. Searle, also with present faculty and personnel director. A questionnaire was sent to 1,050 graduates representing all classes from 1916 to 1946.

Findings and Conclusions: The training that was given the students in the shop enabled most of the graduates in the early days of the school to get jobs as mechanics. Today, apprentices are formally indentured. The graduates of the trade school receive from 2,000 to 4,000 hours of credit when apprentices according to the type of training that they have received and the length of time spent in the school as regular students and as post-graduate students. If the value of the training was judged on the percentage of graduates who were employed as skilled workers, the score would be quite high. The statistics gathered show that only one-third of the graduates who worked for the Ford Motor Company after graduation are working there now. However, the management of the school insists that the students always have been, and still are, free agents after graduation and may work anywhere they wish with the school's blessing. The percentage of graduates who at some time did or who now hold positions of leadership is significant, more than 50 percent. The type of position now held by the graduates was revealed by the survey. Eight percent of them are superintendents or managers of shops or factories; 13 percent are foremen, supervisors or leaders; 5 percent own tool or manufacturing shops; and 10 percent are engineers of various kinds. Altogether, 36 percent of them are still in positions above the level of journey-man. In addition, 11 percent are designers or draftsmen; 6 percent are college students, while 11 percent are not engaged in industrial pursuits. Some significance may be attached to the statements by 53 percent of those who served in the Armed Forces during World War II that they were advanced in rank because of their trade school training. Many boys were enabled to continue in school, 43 percent, who would otherwise have had to go to work. The value of the training given at the trade school in the estimation of the graduates may also be judged by the number who recommend its training program to others, 93 percent of them. In the training of its students in shop techniques, skills, and work habits, the school appears to have done a better job than most other schools are able to do. It appears reasonable to say that the school does not merely duplicate the training offered in other high schools, but in its shop training program far excels public schools.

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2086. OLIVO, C. THOMAS. *An Evaluation of the Adequacy of the Program of Vocational Education in Erie County, New York.* Ed. D., 1954, New York University. 145 p. Library, New York University, New York.*

Purpose: To ascertain how the present programs of vocational education in Erie County were meeting current and projected labor market needs for trained workers; and, as the data revealed inadequacies, to recommend revised programs of such vocational education.

Source of Data: Data were secured through an occupational survey of 435 firms in Erie County, U. S. Bureau of the Census Occupation population data, survey of training facilities, labor market studies in New York State, Federal, State, local vocational education research studies, and resource material.

Findings and Conclusions: The vocational education facilities in Erie County varied from those having more equipment than the demand for training justified to programs which were inadequate. Recommendations were made for new programs and combined programs to better utilize existing facilities.

2087. PICKENS, THOMAS HARRISON. *Evaluation of Guidance Activities in Representative Arkansas High Schools.* M. P. S., University of Colorado, 1948. 100 p.

This study is an effort to evaluate guidance activities of seven Arkansas Valley secondary schools measured by a standard program. A pupil personnel questionnaire was developed to survey desirable guidance practices and was used in an interview with school officials. The data were compared and measured against a standard program. Strengths and weaknesses of Arkansas Valley schools were indicated, and a functional program formulated.

2088. PINSON, LAWRENCE GALE. *An Evaluation of the Driver Education and Training Program in the Olympia, Washington, High School.* M. S. 1954, Oregon State College. 81 p. Library, Oregon State College, Corvallis.

Purpose: To evaluate the driver training course taught at Olympia High School, Olympia, Washington between 1947 and 1953.

Source of Data: Data were obtained through a study of the driving records of students completing the course in comparison with those receiving no formal driver training instruction.

Findings and Conclusions: The Olympia High School driving course has been effective in reducing the number of accidents and violations of the trained drivers in comparison with untrained drivers. The reduction of accidents compared favorably with a national average of fifty per cent fewer accidents for trained students.

2089. PIPPETT, LLOYD A. *Evaluation of Industrial Arts Subjects in East High School, Sioux City, Iowa.* M. S., 1953, Iowa State College. 33 p. Library, Iowa State College, Ames.

Purpose: To obtain opinions as to the value of industrial arts from graduates of East High School that might affect curriculum changes.

Source of Data: Data were obtained through questionnaires from 206 graduates of the years 1950–1952.

Findings and Conclusions: Of the graduates responding, 23.9 per cent were working, 37.8 per cent were in college, and 38.3 per cent were in military service. Industrial arts was thought to be of "some value" to the employed group. Courses needing greater emphasis were: auto mechanics, mechanical drawing, architectural drawing, woodworking, electricity, radio. Courses listed as of little or no value were machine shop, metal work, printing, and plastics.

2090. QUICK, THOMAS J. (Masters). *An Evaluation of the Industrial Arts Program of the County High Schools of Licking County, Ohio.* Ohio University, 1941.

2091. RAFFENSPERFER, LEONARD (Masters). *The Effectiveness of a Vocational Program in a Large Iowa High School.* State University of Iowa, 1942.

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2092. REESE, ROBERT MAX. *An Evaluation of the Ohio Teacher Education Program for Trade and Industrial Education Teachers.* Ph. D., 1954, The Ohio State University. 153 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the nature of the problems encountered by beginning trade teachers, the frequency with which the problems occur, and the effectiveness of Ohio's program of trade and industrial teacher education in solving these problems.

Source of Data: Data were obtained by a check list submitted to two hundred forty Ohio vocational-industrial education teachers, which was then developed into an evaluative check list validated by forty-two specialists and checked by two hundred seventy-five teachers.

Findings and Conclusions: A list of problems of beginning vocational-industrial teachers was developed. These teachers tended to agree on major problems. Teachers do not recognize as potential problems their own personal characteristics. The vocational-industrial teacher training program provides help to most beginning teachers on their teaching problems. An in-service training program composed of short units appears to be more feasible and practical than a program of organized courses which operate for a full school period.

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2093. RUBIN, MORRIS MAURI. *Procedures in Evaluating Private Trade Schools.* Ed. D., 1950, University of Pennsylvania. 269 p. Penniman Library, University of Pennsylvania, Philadelphia.

Purpose: To take a first step in the evaluation of private trade schools. To develop and present materials and procedures to be used in evaluating private trade school programs.

Source of data: The approach to the problem was first made by reviewing the literature and publications of the various Federal, State and local offices and of the authorities responsible for the administration and supervision of vocational education in public and private schools. This led to the review of the rules and regulations used by the States licensing and governing private trade schools and to the review of the standards of practice recommended by various recognized agencies and associations in accrediting private trade schools for membership. Full consideration is given to program differences existing among the schools. Individuals, representing various States over the country, agencies concerned with vocational training, and private trade schools in and about Philadelphia, constituted a "jury of reviewers" for this study. The private trade school directors, who were to serve as reviewers, were asked to use the tentative draft of the evaluation materials for self-evaluation of their schools and, later, to have their self-evaluations checked by visiting committees. Accordingly, two sets of materials were sent to individuals representing 11 States and 4 agencies concerned with vocational training. In addition, 9 private trade schools (8 located in Philadelphia, one in Camden, N. J.) were contacted personally to solicit cooperation in reviewing the evaluation materials and in using the materials for self-evaluations and visiting committee evaluations in their respective schools.

Findings and Conclusions: The materials of evaluation are proposed as the first stage of evaluating private trade school programs. It is believed that the use of these materials as part of local, regional, and national programs in private trade school education, and an application of the materials to all such programs over the country would result in obtaining data which, for all practical purposes, would be reliable as a basis for establishing standards.

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2094. SEIDEL, JOHN JACOB. ***A Plan for Studying Vocational-Industrial and Vocational-Technical Education Programs.*** **Ed. D., 1951, University of Maryland. 492 p. Library, University of Maryland, College Park.**

Purpose: To provide an effective plan for making comprehensive evaluations of Vocational-Industrial and Vocational-Technical Education programs.

Source of Data: Data for use in developing the techniques and instruments were obtained from a group of educators representing both general and special education. The resolved plan was a result of trail-revision, and the cooperative effort of the evaluator and those evaluated, aimed at improvement from within.

Findings and Conclusions: In using these evaluative devices in New York City the following proposals resulted: Guidance services should be available to all youth at all levels. Courses in vocational education should be offered during those years just prior to employment. More broadly conceived exploratory courses should be organized for the 7th, 8th and 9th grades in all schools. Certain changes should be made in the recruitment, assignment, and improvement of professional personnel. A continuous city-wide planning program for vocational education should be developed. The relationship of the vocational advisory board to the board of education should be clarified and activities of the advisory board should be extended. Many adjustments should be made in both the academic and vocational high schools to provide a broader program. As soon as possible new buildings and new equipment should be provided for the vocational program. Equipment and supplies should be increased and handled more effectively. The placement program for graduates as well as 'drop-outs' should be strengthened. Services offered by the State Department of Education should be expanded. Instructional procedures should be improved. Part-time cooperative education should be expanded and a diversified occupations program should be developed. There should be a continuous evaluation plan for the further development of vocational education program.

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2095. SELLON, WILLIAM A. ***A Study of Methods of Evaluation and Their Application to Industrial Arts With Suggestions for the Content of a Course in Techniques of Evaluation.*** **Ed. D., 1950, Bradley University. 186 p. Library, Bradley University, Peoria, Ill.**

Purpose: To determine what techniques of evaluation might be used by industrial arts teachers in determining student progress, and to determine what might be included in a techniques of evaluation course on an undergraduate and/or graduate teacher training level.

Source of Data: Documentary, questionnaire (random sampling), and questionnaire (jury technique).

Findings and Conclusions: The evaluative process is necessary to a dynamic education. This process must be comprehensive and continuous to cover the various facets of the individual student, and it must be in terms of the course or area objectives. The process must also aim toward helping the student in light of the evaluative results. The evaluative cycle, throughout the years of education, started as a highly subjective process, and moved to a rather objective state. It is now returning to a point where an evaluative framework is being built using the good points of the objective type and the subjective or "estimated" type of evaluation. Evaluation in all areas of education and philosophy tends to bring about a great deal of disagreement between "authorities," due to the subjective and abstruse characteristics of those values upon which evaluation must be based. Industrial arts teacher education majors on the graduate and undergraduate level can profit from a course in techniques of evaluation offered in the area of industrial arts. A brief outline of this suggested course is also given in one of the concluding chapters.

2096. SMITH, OSBORNE DOUGLAS. ***Industrial Arts in the Secondary Schools For Negroes in Louisiana.*** **M. A., 1952, The Ohio State University. 83 p. Library, The Ohio State University, Columbus.**

Purpose: To evaluate the physical facilities for industrial arts in the secondary schools for Negroes in Louisiana.

Source of Data: Data were obtained by applying validated criteria to a selected number of secondary schools in the State of Louisiana.

Findings and Conclusions: Ninety per cent of the industrial arts laboratories are entirely inadequate. Materials, supplies, and equipment are not of such nature as to provide for achieving the objectives of industrial arts. The lighting and ventilation are not adequate for promoting health and safety. The individuals responsible for planning the physical plant should re-examine their concepts of industrial arts and re-evaluate the programs.

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2097. SPEER, HUGH WILSON. ***Evaluation of General Education in Industry.*** **Ph. D., 1950, University of Chicago. 175 p. Library, University of Chicago, Chicago, Ill.**

Purpose: To develop a theory of general education in industry. To construct instruments to measure the educational outcomes of such a theory. To evaluate an experimental program of industrial education conducted under university guidance through the use of instruments based on this theory.

Source of Data: Four features of general education were developed and then adapted with necessary delimitation to the industrial situation. The 4 features are as follows: The commonality feature; the holistic feature; the generalization feature; and the functional feature. The evaluation was made at three levels: The theory level; the operational level; and the result level. At the result level, evidence was sought on desirable behavior changes in terms of understandings, skills and attitudes produced by the school experience. Evaluation of 6 broad objectives was made.

Findings and Conclusions: The personnel have gained a deeper and broader sense of social responsibility, evidenced by a better understanding, greater concern and more constructive attitudes toward major social issues ranging from community to international problems. The personnel now employ better forms of written and oral expression and have established better communication within the company. The personnel have a better understanding of human behavior and demonstrate better skill in human relations. The personnel have a better understanding and appreciation of the company and better orientation in its relation to the socio-economic system. As a result of the school experience, the personnel have risen in the estimation of their co-workers.

2098. STORM, EUGENE MAX (M. A.). ***Navy Recruit Training and Some Implications for General and Vocational Education.*** **Stanford University, 1938. 128 p.**

An analysis of the training program of the U. S. Navy in San Diego. This program is compared with school programs.

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2099. TREGILGUS, EARL PERRIN. ***A Survey and Evaluation of the Employee Training Programs in the Laundry and Dry Cleaning Industries in Indiana.*** **Ed. D., 1954, Indiana University. 268 p. Library, Indiana University, Bloomington.***

Purpose: To ascertain the training practices and procedures of the laundry and dry cleaning industries in Indiana and to evaluate the effectiveness of the training programs in operation.

Source of Data: Data were secured by questionnaire, personal interviews, and an evaluation check list.

Findings and Conclusions: Most employees receive some training for the job they are to do. In most cases the plant owner is responsible for employee training. Most training is to the "tell 'em and show 'em" type. Little use is made of the services of vocational school personnel in the training of employees. The labor turnover rate is high. Most of the objectives of the training programs are usually achieved, although with varying degrees of success. The training programs seem to meet the present needs of the industries, are worth their cost of operation, need to be modified to meet changing conditions, but could not be discontinued or shortened without ill effects.

2100. STRIEBY, BLANCHE BEATRICE (M. S.). ***The First Year of Defense Training, Newton, Iowa.*** **University of Denver, 1942. 65 p.**

A survey and descriptive analysis of the first year of the defense training program in Newton, Iowa.

2101. STUBBLEFIELD, LUSK COLVILLE. ***An Evaluative Study of the Adult Education Program of Wilmington College from 1947 through 1954.*** **M. of I. A., 1955, North Carolina State College. 54 p. Library, North Carolina State College, Raleigh.**

Purpose: To learn whether the current program of adult education at Wilmington College is keeping pace with the community's population and industrial growth, and to ascertain the effectiveness of the present adult education program and the types of additional courses which should be offered.

Source of Data: Data were obtained by questionnaires and interviews.

Findings and Conclusions: The expressed needs and requests of those contacted closely parallel the offerings of the adult education program, with the exception of vocational-technical courses. The majority of requests were for late evening classes. The appointment of an adult education director to coordinate the overall program is needed.

2102. WAITE, LLOYD L. (Masters). ***An Evaluation Study in Industrial Arts.*** **Ohio State University, 1937.**

2103. WELLS, FLORENCE H. (Masters). ***Evaluation of Selected Personnel Practices in Harriet Whitney Vocational School for Girls.*** **University of Michigan, 1945.**

2104. WILLIE, EARL J. ***Evaluation of "A Program in Industrial Education."*** **M. A., University of Minesota, 1948. 66 p.**

An analysis of the factors to be considered when evaluating the effectiveness of a day preparatory trade training program.

Handbooks, Teacher Guides, Materials Available from Industry

2105. ABISSI, CARMELO F. ***Mathematics Study Guide for First Term Mechanical Students at the Institute of Applied Arts and Science.*** **M. S. in Ind. Ed., 1950, Cornell University, 87 p. Library, Cornell University, Ithaca.**

Purpose: To compile a study guide to teach mathematic skills and principles, and to teach the student orderly procedure in the presentation of written assignment, and to develop self-reliance in the student.

Source of Data: All Courses requiring mathematics were listed and their mathematical needs analyzed. Once the needs were established the analysis started with the most needed skill and continued to the least needed skill.

Findings and Conclusions: A study guide was developed to supplement lectures and reference material, covering such mathematical needs as: Slide rule, fundamental arithmetic processes, fundamental algebraic principles, simple equations, and the quadratic equation.

2106. AMNASAN, CORNELL. ***Selection, Criteria, and Directory of Occupations Applicable to the Vocational Diversified Cooperative Training Program in Ohio High Schools.*** **M. A., 1955, The Ohio State University. 68 p. Library, The Ohio State University, Columbus.**

Purpose: To ascertain the scope of occupations applicable to the Diversified Cooperative Training Program in Ohio high schools.

Source of Data: Data were obtained by compiling an extensive list of suitable occupations which was then submitted to the Diversified Cooperative Training Coordinators in Ohio for validation.

Findings and Conclusions: A directory of occupations for Ohio was compiled. This directory includes the titles of occupations, a brief description of each occupation, occupational code numbers as assigned by the Dictionary of Occupational Titles, and an indication of available related material.

2107. BAUMAN, HAROLD JOHN. ***Optical Apprentice Handbook.*** **M. A., University of Michigan, 1942. 180 p.**

An analysis of the optical trade with suggested reading. It could be used as a basis upon which an expanded training program could be established.

2108. BAUMANN, ISIDOR MAX. ***A Directory of Vocational Training Facilities in Schools and Hospitals in Baltimore, Maryland.*** **M. A., University of Maryland, 1948. 110 p.**

A directory intended for use as a guide for counselors and persons interested in vocational training.

2109. BECK, ALONZO O. ***Student Problems for Vocational Shop Teachers Handbook.*** **M. S., 1949, Oklahoma Agricultural and Mechanical College. 39 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To provide information on materials to be included in one phase of a handbook for shop teachers.

Source of Data: Questionnaires were sent to all shop teachers in Oklahoma and all State supervisors in the several States.

Findings and Conclusions: Only 3 States out of 31 have a handbook for shop teachers. Vocational shop teachers need a handbook as a guide in carrying on a successful shop program.

2110. **BENNER, EDGAR F. (M. Ed.).** *A Handbook for Students in a Part-time Diversified Occupational Training Program.* Colorado Agricultural & Mechanical College, 1943. 63 p.

A study of the need for a student handbook covering the diversified occupations program in Roanoke, Virginia. A handbook that presents the personal requirements needed by the worker in getting and holding a job is designed.

2111. **BLANK, NEIL E.** *A Handbook in Industrial Arts for the Aberdeen (South Dakota) Secondary School.* M. A., University of Minnesota, 1946. 125 p.

A study to develop a handbook for administrators, supervisors, and teachers of industrial arts in the public schools of Aberdeen, S. D.

2112. **BOWYER, OLIVE A.** *A Guide for the Tradesman-Teacher.* M. A., University of Minnesota, 1944. 85 p.

A brief series of lessons on basic principles and procedures of teaching for the tradesman who undertakes to impart his skill and technical information to adult groups. An orientation to teaching for the novice who might later wish to confirm and strengthen his interest in the field by enrollment in regular teacher-training classes for vocational instruction.

2113. **BRILL, DONALD M.** *A Guide For The Teaching of Plastics.* M. A., 1949, University of Minnesota. 145 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop a guide for teaching plastics.

Source of Data: Data were obtained from books.

Findings and Conclusions: A senior high school course in plastics was prepared.

2114. **BROWN, FRANCIS E.** *Plastic Projects Index.* M. A., 1949, University of Minnesota. 29 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop a plastic projects index.

Source of Data: Data were obtained from textbooks and magazines over the period 1944 to 1948.

Findings and Conclusions: An index with suggestions for its use is included in the report.

2115. **CAMPBELL, IRWIN M.** *A Survey of Teacher-Interest in a Workbook for Printing Education.* M. A., 1950, University of Michigan. 36 p. Educational Library, University of Michigan, Ann Arbor.

Purpose: To make a workbook in printing and to survey teacher interest in such a book.

Source of Data: A questionnaire was employed to get a cross-section reaction from 1000 of the teachers in the 2444 U. S. Schools teaching printing. A return of 21.5 percent was obtained. Post cards were sent to the 2444 schools advertising the workbook.

Findings and Conclusions: Of the 21.5 percent questionnaires returned, it was found that 89 percent of the teachers favored the workbook idea. Eleven percent were definitely unfavorable. Additional information indicated that the emphasis of the teachers was on the following areas, in order of their importance: Composition, press work, paper, layout, ink and color, foundry type, binding, art and design, engraving, and linoleum block printing. The author recommended, on the basis of the information supplied by the questionnaire, that the workbook be aimed for use in senior high schools, but flexible enough to fit the junior high also; it be a loose-leaf book, designed to parallel Polk's *Practice of Printing;* the retail price not to exceed $2.50 or that it approach the rate of $.02 per single sheet.

2116. **CLEWELL, EUGENE FREDERICK.** *Educational Services Available Through Trade Associations.* M. A., 1950, Ohio State University. 117 p. Education Library, Ohio State University, Columbus.

Purpose: To have access to information and teaching materials for industrial arts teachers that are authentic, up-to-date and representative of industry as a whole.

Findings and Conclusions: National trade associations represent all but a small part of trades and industries and the vast majority of firms within these areas. It is maintained that the materials and the services listed are consistent with the normal content and objectives of industrial arts and do not contain mention of brand names.

2117. COVERT, HERBERT H. *A School Administrator's Handbook for Vocational Education.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 45 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To provide a source of information for school administrators relative to organization and administration of vocational education.

Source of Data: Data were obtained by means of questionnaires sent to administrators of Texas, New Mexico, and Oklahoma, and by interviews with a number of administrators.

Findings and Conclusions: Questions most often needing clarification for school administrators are: the place of vocational education in the total program of education; responsibility and authority for vocational personnel; information as to possibilities of the four services; duties of teaching personnel outside the classroom; and pertinent information relative to the development of a comprehensive vocational program.

2118. COX, GEORGE B. (M. S.). *A Guide to a Shop Planning Program for Oregon Schools.* Oregon State College, 1940. 167 p.

An analytical study of the needs of Oregon public schools, the present facilities, enrollments, and finances as compared with like factors of other geographic areas. A program for improvement is suggested.

2119. COX, JOHN HENRY (M. A.). *A Study of Certain Agencies in Baltimore, Maryland Offering Vocational Training of Less Than College Grade.* Ohio State University, 1935. 59 p.

The development of criteria for selecting schools and agencies offering vocational training of less than college grade. The criteria developed are applied to schools in the Baltimore, Maryland area. A directory of private schools offering vocational education of less than college grade is included.

2120. CRAVEN, WAYNE D. *New Materials with Implications and Suggestions for Industrial Arts.* M. S., 1952, Kansas State Teachers College. 137 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To compile information on seventy-two new materials, their manufacturers, and use in industrial arts.

Source of Data: Data were obtained from correspondence with leading manufacturers in regards to new materials that have been developed.

Findings and Conclusions: Sixty-one products under the several headings of: plastics, woods, finishes and upholstery, art metal, and miscellaneous are described, discussed, and applied to industrial arts use.

2121. CUTHBERTSON, GILBERT (M. S.). *A Work Book for the Beginning Worker in Service Stations.* Colorado Agricultural & Mechanical College, 1940. 73 p.

A report on operations handled by the service station beginning worker. Units of work for each type of job that the beginner might do are developed. These units include topics such as doing the job, knowing the job, steps to be followed, and reading material.

2122. DALTON, CHARLES H. (M. Ed.). *A Handbook on Graphs for Secondary School Pupils.* Colorado Agricultural & Mechanical College, 1944. 38 p.

A handbook suggesting a method which may be used as a guide in teaching a unit on graphs. Graphs frequently appearing in popular magazines are included as a unit in a course in mechanical drawing.

2123. DANIELS, ERNEST F. (M. S.). *Evaluation of Industrial Education Handbook Material for the Trade and Industrial Program in Missouri.* Iowa State College, 1944. 158 p.

A study of the handbooks of fifteen states on state programs in trade and industrial education to formulate a set of guiding principles for preparing a state handbook for Missouri.

2124. DAVIS, WILLIAM R. *Teachers' Guide Sheets for Teaching Related Information in Maintenance Mechanics.* M. S., 1950, Oklahoma Agricultural and Mechanical College, 48 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To prepare guide sheets to assist instructors of maintenance mechanics in teaching related information.

Source of Data: Forty topics were selected from the course outline in maintenance mechanics, limited to machine shop, welding and sheet metal. References were obtained, the needed information secured, and the sheets prepared.

Findings and Conclusions: The instructor should have on hand a set of guide sheets as a foundation on which to build a better plan of instruction. Such guide sheets are provided.

2125. DOANE, RAYMOND C. ***Shop Planning Guides for Industrial Arts Teachers.*** **M. S., 1950, The Stout Institute, 91 p. Library, The Stout Institute, Menomonie, Wis.**

Purpose: To compile guiding statements containing suggestions and specifications which may help industrial arts teachers, supervisors, and administrators to plan and organize shop equipment for efficient utilization and instruction.

Source of Data: A survey of the pertinent literature revealed a comprehensive list of books and periodicals. An analysis of these source materials provided a basis for the selection of appropriate data for the investigation. Notes were then gathered from the source materials which, revised, took the form of the suggestions and specifications contained in the guides.

Findings and Conclusions: In order to obtain optimum growth in each student, the industrial arts laboratory must be planned to meet his needs. Chapter III contains an abundance of directive statement developed to serve as guides for persons responsible for shop planning. The writer of the investigation recommends the making of two more studies in the field of shop planning; the selection of equipment and the architectural and structural phases of industrial arts laboratories.

2126. DOUGHMAN, JOHN. ***A Manual of Standard Formats for Vocational Trade and Industrial Written Teaching Aids.*** **M. Ed., 1950, University of Cincinnati. 202 p. Library, University of Cincinnati, Cincinnati, Ohio.**

Purpose: To survey the existing types of written teaching aids, to study and analyze samples of aids, to develop standard formats, to secure competent criticisms and suggestions for the formats developed, and to arrange the formats in a logical order.

Source of Data: Data were secured from books, bulletins, monographs, periodicals, written teaching aids used in Ohio, and samples of written teaching aids developed and used in other states.

Findings and Conclusions: The formats developed combine the best features found in written teaching aids.

2127. DRAKE, CLENDON B. (M. S.). ***A Teaching Manual for Junior High School Industrial Arts.*** **East Texas State Teachers College, 1941. 204 p.**

A compilation of course material. The study includes the philosophy of industrial arts education in the junior high school and the place of industrial arts in general education.

2128. EASON, GENE. ***A Guide to Industrial Occupations in Jackson, Mississippi.*** **M. A., 1951, University of Minnesota. 68 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To collect data concerning work opportunities and training programs for use in vocational guidance in Jackson public schools.

Source of Data: Data were obtained from a personal survey of five sources of employment information.

Findings and Conclusions: A need for public vocational education and a vocational guidance program exists in Jackson. A complete list of local manufacturers and wage rates is reported.

2129. ECKERT, CHARLES A. (Masters). ***An Orientation Guide for Industrial Arts.*** **Ohio State University. 1939.**

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2130. ENGLISH, ROBERT W. ***A Guide for the Planning of School Buildings for Vocational Industrial and Vocational Technical Programs of Education.*** **Ed. D., 1950, The Pennsylvania State College. 236 p. Library, The Pennsylvania State College, State College.**

Purpose: To develop material which can be helpful as a guide to school administrators, teachers, and architects who are planning facilities for vocational industrial and vocational technical education.

Source of Data: Review of existing literature and survey of existing and desired facilities in vocational industrial and vocational technical high schools in New York State.

Findings and Conclusions: Chapter 4 of the dissertation presents a proposed guide for school men and architects who plan buildings for industrial and technical education. Since the guide is lengthy and detailed, pertinent principles are summarized in the form of a series of 54 principles dealing with specific areas such as school shops, classrooms, toolrooms, storage rooms, locker space, toilet facilities, and the like.

2131. FAUSCH, JOHN ROBERT. *An In-Service Teacher Training Guide.* M. A., 1954, University of Minnesota. 75 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To examine the in-service teacher training needs of certain types of trade and industrial instructor in Minnesota and to construct a teacher-training guide for use in meeting those needs.

Source of Data: Data were obtained from a questionnaire sent to selected Minnesota trade and industrial directors, supervisors, coordinators, principals, and teacher trainers.

Findings and Conclusions: An In-Service Teacher Training Guide was developed, consisting of eighteen lessons dealing with basic teaching methods and procedures needed by the new trade and industrial instructor.

2132. FELDEN, OSCAR ANDREW. *Revision of Handbook for Student Teaching in Industrial Education.* M. E., 1949, Wayne University. 119 p. Department of Industrial Education. Wayne University, Detroit, Mich.

Purpose: To revise the Handbook for Student Teaching used in Education 213 IE at Wayne University, Detroit, Mich.

Source of Data: Data were obtained from The Handbook for Student Teaching in Industrial Education, Household Mechanics, 1942.

Findings and Conclusions: The handbook in its revised form should be used for at least one semester before it is adopted in its final form. The revised form of presentation by assignments should provide a systematic approach to the fulfillment of the objectives of student teaching.

2133. GAIL, GEORGE C. *A Periodical Index of Woodworking and Cabinetmaking Projects.* M. A., 1949, University of Minnesota. 98 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To provide a means of locating and selecting plans for functional and well-designed woodworking projects.

Source of Data: Indexed more than 7,000 woodworking projects suitable for industrial arts classes, homecraftmen and journeymen, located in 10 journals common to most schools and public libraries, over a span of 10 years.

Findings and Conclusions: Projects considered outstanding examples of good design and construction have been started for convenience to readers.

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2134. GARBEE, EUGENE EMMETT. *A Guide for Conducting Crafts in Camps.* Ed. D., 1949, New York University. 256 p. Library, New York University, New York, and Library of Congress.

Purpose: To develop a guide or handbook for the conduct of craft programs in camps. To help the craft counselor better understand the approach and development of the creative technique in crafts.

Source of Data: A large part of the investigation is based on the questionnaire technique which was used to find out what was done in craft programs during the 1948 season in 302 camps. The camps were selected from 17 Eastern States through random sampling. A jury of experts were used to help construct the questionnaire and to criticize findings. A survey was made of available camp craft literature to determine objectives and a philosophy.

Findings and Conclusions: Camp leaders are generally interested in including crafts in the camp program and make an effort to employ trained personnel. Trained craft counselors are difficult to find for camp employment. Camp administrators are not in agreement as to the best procedures for conducting crafts in camps. Campers should be given opportunities to aid in the selection of the craft projects to be made and the scheduling prescribed. The use of the junior counselor-in-training plan is advocated. The data in the study indicated that power tools are not advisable for camps. Much of the data pointed to the desirability of hand tools in the camp program because of the many skills which the camper could experience through their use. The materials most frequently provided in camps are wood, leather, and metal, and these materials are the ones that campers prefer most in crafts. The lists of basic skills may furnish the crafts counselor and the camp leader a ready reference for planning the craft program in camp. The basic skills were identified and ranked in a sequential order of difficulty with 20 skills included for woodcraft, 38 skills for leather craft, 23 skills for art metal craft, and 23 skills for clay craft. Through the proper selection of craft projects in an area of materials, a camper may be expected to gain a number of experiences in the use of each of the skills identified in that area.

2135. HACKNEY, BASIL MASON. *A Teaching Guide in Blackboard Sketching for Trade and Industrial Evening School Teachers.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 228 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To show the need for teaching trade and industrial evening school teachers the fundamentals of blackboard sketching and to assist them in developing this skill.

Source of Data: Data were secured from books and other publications.

Findings and Conclusions: A short thirty-hour course in blackboard sketching is included.

2136. HALL, CHARLES G. *Instructor's Guide Sheets for Health and Safety.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 78 p.

An analysis and selection of source material for teaching health and safety in vocational training courses. A series of guide sheets for use by instructors in teaching occupational health and safety to vocational training classes.

2137. HARLAN, JOHN OWEN. *Workbooks for the General Shop.* M. A., University of Minnesota, 1945. 120 p.

A report on organization of content, planning of assignments, etc. to make pupils more selfsufficient in general shopwork at school and at home.

2138. HASTINGS, BENJAMIN NORFLET (M. A.). *Basic Operations in Mechanical Drawing.* George Peabody College, 1934. 198 p.

A description of mechanical drawing and its many uses. A workbook on how to draw as a method to simplify the teaching of mechanical drawing is presented.

2139. HEAD, WILLIAM H. *Handbook for Coordinators of Diversified Occupations.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 56 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To revise the 1942 edition of the handbook for coordinators.

Source of Data: Diversified occupations handbooks from 12 States were examined for suggestions in revising the Oklahoma 1942 diversified occupations handbook. An analysis was made of material, and new ideas gleaned for inclusion in the handbook.

Findings and Conclusions: The new handbook for the diversified occupations program in Oklahoma was prepared.

2140. JACKSON, JAMES ROLAND. *Development of Guidebooks for the Cooperative Work-Study Program for Graduate Students and Teachers on Leave.* M. Ed., 1951, Wayne University. 42 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To provide information about the procedures employed in constructing guidebooks of pertinent information about the Cooperative Work-Study Program for graduate students and teachers as carried on between Wayne University and Chrysler Corporation.

Source of Data: Data were obtained from the Director of Industrial Education, Chrysler Corporation, Chairman of Industrial Teacher Education, Wayne University, and graduate students.

Findings and Conclusions: The program needs revision. Guide-books are based on the information which the students thought to be most needed.

2141. JACOBSEN, ECKHART A. (M. S.). *Student's Cumulative Progress Record and Plan Book for Industrial Arts and Vocational Education.* Cornell University, 1946, 28 p.

A summary of practice in Elmira, New York, in compiling guidance information on cumulative records of boys from junior high through the senior high school industrial education program.

2142. JOHNSON, BERTIL EUGENE. *A Leathercraft Projects Index.* M. A., 1954, University of Minnesota. 35 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop a guide to help teachers, students, and home craftsmen to find projects that will be suited to their interests and abilities.

Source of Data: Data were obtained from a review of textbooks, magazines, project books, and design books.

Findings and Conclusions: The increasing interest among educators, students, and craftsmen in this area makes the compilation of such an index a necessary tool of assistance. As indexes are available for all major craft areas, a master index including all these areas would be a valuable reference in any school or home workshop.

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2143. **JULIAN, LESTER JOHN.** *Fleet Air Craft Service Squadron Training in the United States Navy.* Ph. D., 1953, The Ohio State University. 208 p. Library, The Ohio State University, Columbus.

Purpose: To examine the scope, objectives, and techniques used in naval training, to develop a manual, and to formulate criteria for appraising the training in Fleet Air Craft Service Squadrons.

Source of Data: Data were secured by a study of literature and direct observation and interviews with training officers of four active Fleet Aircraft Service Squadrons.

Findings and Conclusions: A set of criteria was established which the Navy could use in establishing future training programs. A curriculum for training aircraft squadron personnel was developed, installed, and evaluated. The writer then submits a series of recommendations designed to strengthen the training and educational program of each of the four Service Squadrons studied.

2144. **KIGHT, STANFORD S. (M. S.).** *A Vocational Education Handbook for Administrators.* University of Southern California, 1946. 200 p.

A study concerned primarily with a typical rural secondary school (130 pupils—6 teachers—1938) in a town under 2500 population. The study points out practical administrative difficulties which have prevented administrators from offering occupational courses, and suggests remedies.

2145. **KISTLER, TED P.** *A Guide for Industrial Arts In The Primary Grades With Reference To H. P. Study Community School, Springfield, Missouri,* M. S., 1954, Kansas State Teachers College. 61 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To evaluate and improve the program in elementary industrial arts, and to present a guide for industrial arts in the first three elementary grades with special reference to the H. P. Study Community School in Springfield, Missouri.

Source of Data: Data were obtained from literature, a survey of six school systems with outstanding programs in elementary industrial arts, and interviews and conferences with teachers in the H. P. Study Community School.

Findings and Conclusions: The report includes drawings of suggested elementary school projects and lists of tools and materials needed. Elementary industrial arts, the report contends, has a definite place and should be integrated with regular classroom work.

2146. **KNOWLES, DURRELL K.** *Teacher Guide Sheets For Teaching Powerglide Transmission Service.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 32 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop instruction sheets in powerglide transmission for vocational auto mechanics instructors.

Source of Data: Data were obtained from textbooks, reference books, manufacturers service manuals, and the General Motors Institute.

Findings and Conclusions: The instruction sheets give the instructor an organized plan for teaching powerglide transmissions. The study includes: torque converter; planetary unit and clutch; oil pump; and hydraulic controls.

2147. **KYSAR, NED NELSON.** *A Student Handbook for the Diversified Occupations Program.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 56 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To provide a handbook to orient students into the diversified occupations program.

Source of Data: Collection and examination of all available diversified occupations handbooks and other pertinent material.

Findings and Conclusions: All coordinators and supervisors of trade and industrial education were interested in the development of student orientation material. This handbook could be used as a text from which several orientation lessons could be taught.

2148. LAING, CHARLES W. (Masters). *A Handbook of Building and Constructing for Secondary Schools.* Arizona State Teachers College, 1942.

2149. LAIRSEY, JESSIE WALKER. *A Jacksonville, Florida Directory for Industrial Arts Field Trips.*, M. Ed., 1952, University of Florida. 92 p. Library, University of Florida, Gainesville.

Purpose: To furnish a ready reference to Jacksonville industries, including pertinent information concerning the managerial personnel.

Source of Data: Data were secured from books and reports, and from the Jacksonville Chamber of Commerce, personal contacts, telephone calls, and questionnaires.

Findings and Conclusions: Industrial arts teachers should study community industrial resources preliminary to utilizing them more widely. Field trips should be carefully planned and conducted if they are to be worthwhile.

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2150. LAND, SAMUEL L. (Doctors). *Trade Associations—Their Services to Education.* New York University, 1931.

2151. LANG, EDWARD H. (M. S. in Ed.). *The Development of a Technical Handbook for Use in Vocational High Schools.* Cornell University, 1938. 70 p.

A study to develop and compile a technical handbook which would be suitable for student use in all phases of the vocational program.

2152. LUEBEN, FLOYD J. *Counselors' Handbook and Directory.* M. A., University of Minnesota, 1945. 355 p.

A handbook and directory for the use of Veterans Administration counselors.

2153. MATTSON, LLOYD H. *A Proposed Outline of an Industrial Arts Student Teacher's Handbook.* M. S., 1951, Stout State College. 74 p. Library, Stout State College, Menomonie, Wis.

Purpose: To outline an industrial arts handbook for student teachers, new teachers entering an assignment, and supervisors.

Source of Data: Data were obtained from a review of literature and a survey of present practices of handbooks in the field.

Findings and Conclusions: Literature directly related to the problem was lacking. Very few handbooks were available. The outline developed consists of two parts: inductive information and possible activities of the new student teacher.

2154. McGILL, CARLOS L. (Masters). *A Handbook for Co-ordinators of Part-Time Diversified Occupations in Oklahoma.* Oklahoma A & M College, 1942.

2155. MILLER, JACK TUNSTALL. *A Directory of Vocational Training Opportunities in Denver and Metropolitan Area.* M. P. S., 1950, University of Colorado. 179 p. Library, University of Colorado, Boulder.

Purpose: To identify and catalog the occupational training facilities in existence in the Denver metropolitan area.

Source of Data: Data were obtained through a study of the occupational training facilities in the schools and industries of the Denver metropolitan area.

Findings and Conclusions: The training facilities in the area include 57 trades offering apprenticeship programs, 26 public, private and parochial high schools, five colleges and universities, and 187 private vocational schools of one sort or another.

2156. MURPHY, FRED E. *A Teaching Guide for Elementary Electricity.* M. A., 1950, University of Minnesota. 170 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare a course of study focused upon the needs and interests of the adolescent pupil at the Sheridan Junior High School in Minneapolis, Minnesota. (Students are slow learners and need special considerations because of limited experience and background.)

Source of Data: A guide is developed under 5 main headings: Electrical fundamentals, electricity in the home, electricity in industry, electricity, and communication, electricity and electronics.

Findings and Conclusions: Suggestions are made for presenting the course materials in a very simple manner because of pupil's limited background and experience.

2157. NATHAN, JACK (Masters). ***A Workbook for First and Second Year Pupils in an Industrial Arts High School Course in Printing.*** **University of Cincinnati, 1944.**

2158. NELSON, HOWARD F. ***Handbook of Industrial Arts Materials.*** **M. A., University of Minnesota, 1947. 112 p.**

A study of basic expendable industrial arts materials for 6 selected areas or subjects—identification, nature, how produced or processed, uses, etc., as instructional content.

2159. NEUNDORF, NORMAN A. ***A Guide for Wood Fnishing in Industrial Arts.*** **M. Ed. 1953, Agricultural and Mechanical College of Texas. 104 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.**

Purpose: To assemble the necessary information for finishing wood projects in a variety of finishes.

Source of Data: Data were secured from books and magazine articles pertaining to wood finishing.

Findings and Conclusions: Many types of new wood finishes suitable for high school use were discovered and described.

2160. NEWELL, GRACE (M. A.). ***Manual for the Study of Industrial Education through Magazine Articles.*** **George Peabody College, 1931.**

The annotated bibliography of five periodicals in the field of industrial education for a period of ten years, 1920 to 1930. The study lists 194 subjects and includes 1,718 annotated articles.

2161. NICHOLSON, MILTON F. (M. S.). ***An Instructional Manual for Beginning Airplane Hangar Attendant.*** **Colorado Agricultural & Mechanical College, 1944. 115 p.**

An instructional sheet for airplane hangar attendants. A complete list of manipulative jobs of an attendant is included and job sheets are suggested for each job.

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2162. NICKERSON, PAUL SUMNER. ***The Use of Radio and Sound Equipment in Secondary School Instruction.*** **Ed. D., New York University, 1947. 374 p.**

A handbook which will serve as a practical guide to the effective use of radio and sound equipment as instructional aids in secondary education. Material is presented on student listening, script writing, broadcasting, and recording.

2163. OSTEGAARD, ALBERT J. ***A Guide for the Teaching of Elementary Bench Woodworking.*** **M. A., 1950, University of Minnesota. 177 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To design a course of study that will emphasize the exploratory function of industrial arts.

Source of Data: Data were obtained from publications.

Findings and Conclusions: The teaching guide covers organization and management of a class plus several selected teaching units.

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2164. POWER, ANDREW T. ***A Suggested Guide for Use of the Related Arts in an Integrated Curriculum at the Elementary Level in Bloomfield, New Jersey, Public Schools.*** **Ed. D., 1955, New York University. 480 p. Library, New York University, New York.**

Purpose: To develop a guide for integration of the related arts with the general elementary school classroom program, to enrich that program, and to promote child development.

Source of Data: Data were obtained from study guides and courses of study, publications on education and child growth, questionnaires, interviews and school visitations. The normative survey method of research was used.

Findings and Conclusions: Authorities agree that the arts can be used to enrich the general elementary school program and to promote child growth. The arts can be integrated with the elementary school program within the present structure of elementary school classrooms. In-service training can be successfully used to help classroom teachers become more proficient in the use of the arts in the classroom.

2165. PROCTOR, BERNARD SHAW. *Visual Aids for Industrial Arts Classes.* M. A., 1948, Ohio State University. 165 p. Education Library, Ohio State University, Columbus.

Purpose: To collect free and low cost visual aid materials from industry for use in machine shop classes, to classify, to describe, and catalogue these materials and to establish criteria for their use in industrial arts classes.

Source of Data: Letters were sent to 227 industries distributing materials priced at not more than 25 cents. The materials were classified, described, and criteria established.

Findings and Conclusions: The investigation provides an up-to-date directory of establishments involved in activities related to machine shop practices; industry is interested in supplying low cost aids to schools; descriptions should enable instructors more adequately to determine the type of visual aids needed and the criteria can be used as a check list for the use of industrial materials.

2166. RANNEY, HAROLD W. (M. S. in Ed.). *A Review of Some of the Problems Encountered in the Production of a National Defense Manual Entitled Fundamentals of Radio Receivers.* Cornell University, 1942.

2167. RICE, WILLIAM H. *A Shop Training Manual for Arc Welding Operators.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 49 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a set of job sheets for use in training students in arc welding.

Source of Data: Original research.

Findings and Conclusions: No findings or interpretations reported.

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2168. ROBBINS, EVELYN GOOD. *The Handcrafts: A Manual for Teachers and Prospective Teachers of Art.* Ed. D., 1949, New York University. 295 p. Library, New York University, and Library of Congress.

Purpose: To provide the teachers of art with materials for the extension of their field to include the crafts.

Source of Data: Course of study for art in junior and senior high schools were examined (12 in number) to ascertain what handcrafts are taught in these schools. Craft courses as given at various teachers colleges and schools preparing art teachers were considered for content. Theses already published which might contribute to give a picture of the various crafts were examined. Questionnaires were sent out to experienced art teachers (36 in number) asking for a listing of the various crafts taught and what was considered desirable for resource material. Personal visits were made by the author to a hospital and several schools to find out first hand how crafts were taught and what crafts were considered desirable by the instructors.

Findings and Conclusions: Twenty-four craft activities were finally selected as being necessary for consideration and these in turn were listed under 10 headings or classifications. Each activity under these headings is treated by: Brief explanation and history of the activity; technical information given as to the processing or manufacture of the materials used in each activity; examples are given of simple devices that have proved invaluable to teachers as teaching aids and that may be constructed in the classroom; pictures, samples and diagrams together with job analyses are given for finishing a project in each craft or activity; techniques and advice from experience liberally given; the bibliography lists books and reference materials for the complete range of activities considered; the appendix lists supply houses for materials.

2169. ROEHNING, GERALD E. *Basic Electricity.* M. A., 1949, University of Minnesota. 115 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To prepare an instructor's guide to an electrical course for the senior high school.

Source of Data: Documentary—Canvass of the literature as to the field of electricity as a school subject.

Findings and Conclusions: Construction of a beginning basic course in electricity for high school seniors to meet their needs as citizens. Nine units, each complete with teaching aids, necessary materials and an objective test.

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2170. RUTEN, WILLIAM HENRY. *Manual of Metal Working Processes for Engineering Students.* Ed. D., 1953, Columbia University. 219 p. Teachers College Library, Columbia University, New York.

Purpose: To develop instructional material for student use in courses in metal processing in engineering colleges. To overcome weaknesses in the lecture-laboratory method by providing students with laboratory instructional assignments.

Source of Data: Data were obtained by a study of metal processes and a study of existing weaknesses in the lecture-laboratory method.

Findings and Conclusions: Developed was a laboratory instructional assignment book describing each process to be studied in the course. Student can arrange assignments in sequence to be used. Gives an opportunity to prepare for assignments and learn his responsibilities before going to the laboratory. Project also provides a complete guide for metal identification, shaping, and other processes.

2171. SHACKELFORD, RICHARD WALTER. *Handbook for Chenille Animal Handcraft.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 137 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To organize a handbook for chenille animal handcraft.

Source of Data: Each operation is described in an operation sheet. These are arranged in proper order of sequence.

Findings and Conclusions: A self-teaching handbook on how to make "chenille animals."

2172. SCHRODER, LEWIS ERNEST. *A Suggested Guide For Presenting Related Instruction to Trade Welding Students.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 103 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop information sheets and tests for the teaching of related information in vocational welding classes.

Source of Data: Data were obtained through printed materials and a questionnaire.

Findings and Conclusions: Adequate material is available from various sources but not organized as to sequence, or arranged in teaching form.

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2173. SEIDEL, JOHN JACOB. *A Plan Studying Vocational-Industrial and Vocational-Technical Education Programs.* Ed. D., 1951, University of Maryland. 492 p. Library, University of Maryland, College Park.

Purpose: To furnish the necessary instruments and instructions for making a comprehensive study of Vocational-Industrial and Vocational-Technical education programs.

Source of Data: Instruments were developed to serve as a check list in a trial study of automotive shops in eight schools of New York City. The instruments were revised to provide for an evaluation of an entire school with Brooklyn High School of Automotive Trades being selected as the pilot school for this revision. Observers were selected for competence in the fields they were to appraise. A final revision was made to enable a principal and his staff to conduct an appraisal of the entire school or for department chairmen and teachers to determine the status of departments.

Findings and Conclusions: A "Manual of Procedures" was developed for conducting a survey of the school or of a city system. A set of seventeen "Observation Guides" was developed. These contain the criteria for the descriptive appraisal of the various areas of an educational program. A "Guide for Preparation of Descriptive Summary Reports" is presented with a completed sample report included.

2174. SIMON, ROBERT GEORGE. *A Suggested Teaching Guide for Tenth Grade Mechanical Drawing.* M. A., 1955, University of Minnesota. 98 p. Industrial Education Library, University of Minnesota, Minneapolis.

Purpose: To develop a well-organized teaching guide for a tenth grade mechanical drawing class for the Waukesha High School, Waukesha, Wis.

Source of Data: Data were collected from the Waukesha High School and industries in the community.

Findings and Conclusions: Objectives of a two semester course in mechanical drawing are outlined in terms of the expected behavior changes of students. The learning activities are developed from an analysis of mechanical drawing.

2175. SLABY, WILLIAM E. *Preparation of Utility Magazine Articles.* M. Ed., 1953, Wayne University. 90 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To provide industrial arts teachers with a concise manual of instructions for writing how-to-do-it magazine articles.

Source of Data: Data were obtained from recent books and articles relative to the subject.

Findings and Conclusions: The report includes methods of evaluating projects for publication, research procedures, and instructions for writing an article and slanting it to the format of a particular publication. Illustrative materials are included. Detailed instructions are given for preparing a final manuscript and submitting it to a publisher.

2176. SMITH, C. J. W. *Source of Supplies for Woodworking.* M. A., Sul Ross State College, 1939. 52 p.

A handbook for helpful related materials of service to the woodworking instructor; somewhat obsolete since World War II.

2177. SMOTHERMAN, AMOS H. *Teacher's Guide Sheets for Teaching Reated Information in Carpentry.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 44 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop guide sheets to be used by the instructor of carpentry in vocational trade classes.

Source of Data: Interviews of instructors of carpentry, and the teacher training staff at Oklahoma Agricultural and Mechanical College.

Findings and Conclusions: No findings or interpretations reported.

2178. SORENSEN, STANLEY CLIFFORD. *A Suggested Teaching Guide for Vocational Machine Shop.* M. A., 1952, University of Minnesota. 134 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To organize selected machine shop material into a useable teaching guide that will satisfy the course objectives.

Source of Data: Data were drawn from the literature of the field, materials provided by industry, and the author's experience.

Findings and Conclusions: A teaching guide for vocational machine shop is presented; included are references, teaching aids, projects, a list of objectives, related information and a series of teaching units.

2179. STAHL, EDGAR E. (M. S.). *Manual for Student Teachers of Comprehensive General Shops.* Indiana State Teachers College, 1943. 88 p.

A description of the problems commonly found in the comprehensive general shop. The major topics included in the study are the teacher, aims, objectives and content, and administrative problems. Aids to beginning teachers in this subject are suggested.

2180. STERLING, CLARENCE L. *Topics and Teachers' Guide Sheets for Related and Technical Information for Auto Mechanics.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 91 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To prepare a list of technical and related information, together with teacher's guide sheets, for use by instructors of automobile mechanics.

Source of Data: Topics selected from an analysis of the auto-mechanics trade. Material was gathered by interviews with teachers of automobile mechanics.

Findings and Conclusions: No findings or interpretations reported.

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2181. THORP, JOHN HENRY (Ed. D.). *A Handbook in Industrial Arts For Connecticut Secondary Schools.* New York University School of Education, 1945. 330 p.

A study of the philosophies, problems, and conditions of the industrial arts program in Connecticut. A standardized curriculum which offers some flexibility is set up.

2182. URSIN, VICTOR L. *A Study Guide for Architectural Drafting in Senior High School.* M. A., 1949, University of Minnesota. 76 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide a guide to the teaching of architectual drafting in a less cut-and-dried manner, and to offer suggestions for teaching the subject with due consideration to the principle of adolescent learning.

Source of Data: Approach from a problem-solving point of view, assuming that student interest and initiative should be used to most advantage.

Findings and Conclusions: Objectives of course in architectural drawing, outlined in terms of the expected behavior changes of students.

2183. **WILLETT, GERALD B.** (Masters). *Manual for Instructors of Related Physical Science for Trade and Industrial Education.* Massachusetts State Teachers College, 1944.

Job, Operation, Information and Assignment Sheets

2184. **ANDERSON, ALGOT B.** (Masters). *Effectiveness of Written Individual Instruction as Compared with Oral Group Instruction in Woodwork.* Rutgers University, 1931.

2185. **BAILEY, CHESTER PAUL** (M. A.). *Job Sheets and Analysis of Jobs in Elementary Printing.* George Peabody College, 1936. 74 p.

The preparation of individual job instruction sheets for elementary printing, with instructions as to their use. Data is based on an analysis of fourteen groups of jobs to cover these operations.

2186. **BIWER, GEORGE** (M. S.). *The Effectiveness of the Instruction Sheet as a Supplementary Device in Elementary Printing.* Colorado Agricultural & Mechanical College, 1937. 100 p.

This study compares the results achieved from teaching elementary printing with and without an instruction sheet. The results were measured by written and performance tests.

2187. **BOROFKA, PHILIP J.** (M. A.). *An Experiment with Written Instructional Materials in Industrial Arts Teaching.* Ohio State University, 1931. 267 p.

Report of an experiment with a high school foundry class in the use of instruction sheets as compared to oral teaching. Equivalent-groups method of experimentation is used, and evidence indicates the value of the instruction sheet.

2188. **BURRELL, DAVID JAMES** (Masters). *Operation Sheets and Information Sheets for Teaching Fundamental Units of Hand Woodworking.* Washington State College, 1935.

2189. **CARLSON, PHILIP O.** *Activity Assignment Sheets for Beginning Woodworking.* M. A., University of Minnesota, 1948. 90 p.

A study of activity assignment sheets for beginning woodworking classes.

2190. **DOUGHERTY, JOHN WOLFE** (M. A.). *Illustrated Instruction Sheets in Pottery: An Example of the Selvidge Technique of Analysis Applied to Pottery on the School Level.* Ohio State University, 1930.

A treatise on how to operate and develop skills in making pottery. It includes a history of pottery, a description of equipment, and a description of operations from the raw clay to the finished product. Photographs are presented to describe the operation of pottery making in progress. A curriculum for pottery in a high school industrial arts laboratory is developed.

2191. **DOUGLASS, HARVEY JAMES** (M. S.). *Instruction Sheets as Aids in Teaching Handword in Wood.* Iowa State College, 1931. 68 p.

A study to determine the usefulness of instruction and information sheets as aids in teaching the correct procedure and related information necessary for handwork in wood.

2192. **FERGUSON, ROBERT A.** *Work Sheets for Teaching Makeup of Machine-Set Composition in the School Print Shop.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 56 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a series of planned work sheets to aid in teaching skills relative to the makeup of machine-set composition.

Source of Data: Data were obtained by means of questionnaires, reference materials, and trade literature.

Findings and Conclusions: Most printing programs in the State include automatic type casting machines, and teachers are required to teach the operation of the machine and the makeup of machine-set composition. An abundance of material is available on the operation of machines, but very little dealing directly with the teaching of machine-set composition.

2193. **FITZGERALD, WILLIAM ALBERT (M. A.).** *Basic Operations in Printing.* George Peabody College, 1936. 182 p.

The preparation of operation sheets to be used in industrial arts classes, to cover the basic operations in printing as set forth by the committee of the American Vocational Association. Illustrations are included.

2194. **FOLCK, LEO GILBERT (M. S.).** *Value of Instruction Sheets in Teaching Mechanical Drawing.* Iowa State College. 82 p.

A comparison of the results obtained from teaching mechanical drawing with and without instruction sheets.

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2195. **FOWLER, EWELL WELDON.** *Operation Sheets Versus Process Models in Shop Teaching: An Experimental Comparison.* Ed. D., 1949, University of Missouri. 229 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the relative effectiveness of operation sheets and process models when used for reference purposes in shop teaching.

Source of Data: Two sets of job assignments for bench woodwork were prepared which were identical except that one set was keyed to operation sheets and the other set was keyed to three-dimensional process models for reference purposes. The job assignments were tried out experimentally in typical college teaching situations with statistically equated student groups.

Findings and Conclusions: On the basis of the predicted and actual scores made by the students, and other factors considered the following conclusions were reached: The operation sheets were superior to the process models in teaching informational content; the operation sheets were slightly superior to the process models in regard to quality of work; from the standpoint of time required for project construction, the operation sheets and process models were about equally effective; the operation sheets were superior to the process models in regard to acquiring skill in laboratory work; the operation sheets and process models were about equally effective from the standpoint of errors made in project construction; the operation sheets and process models were about equally effective in regard to economy of materials used in project construction; and in regard to effort required on the part of the instructor, the operation sheets were definitely superior to the process models as used in this study.

2196. **FRIESEN, ORLANDO M. (M. Ed.).** *Information Sheets for High School Woodwork.* Colorado Agricultural & Mechanical College, 1947. 214 p.

Thirty-five information sheets based on the results of the use of a check sheet to determine what related information should be given in a class in high school woodworking.

2197. **FUNK, WENNER AHL (M. A.).** *Illustrated Instruction Sheets as a Teaching Device in Home Mechanics.* The Ohio State University, 1933. 241 p.

An attempt to develop a series of practical instructional units involving problems in household repairs. It considers the value of adequately written directions and of stating the purpose of the chosen problem.

2198. **GOULD, ROY HAROLD (M. A.).** *Automobile Mechanics Job Sheets.* Wayne University, 1932. 211 p.

A presentation of exploratory experiences in the field of automotive construction, maintenance, and repair, for use as instructional job sheets.

2199. **GRUBER, JOHN A. (M. S.).** *Individual Instruction Sheets for Junior High School Mechanical Drawing.* Pennsylvania State College, 1932. 88 p.

A study which attempts to determine the difference of accomplishments between students who use individual instruction sheets and those who do not in junior high school mechanical drawing.

2200. **HOOD, EDWARD EARL (M. S.).** *Individual Instruction Sheets for Elementary Mechanical Drawing.* Indiana University, 1931. 95 p.

Job instruction sheets were planned to meet the needs of pupils in schools offering elementary mechanical drawing from two to five periods per week as a part of industrial arts or pre-vocational work. The sheets were developed during the years 1930–31.

2201. **HORTON, LEWIS L.** *The Development of a Set of Criteria for the Construction of Written Instruction Sheets for the Modern Industrial*

Arts Shop. M. S. in Ed., 1950, University of Michigan. 96 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To develop a set of criteria for the construction of written individual instruction sheets for the modern industrial arts shop based on a survey of their educational foundations, historical development, advantages, disadvantages, and uses.

Source of Data: An investigation of the professional literature of the last twenty-five years, numerous visits to industrial arts shops, and frequent conferences with shop instructors.

Findings and Conclusions: A set of criteria was formulated for the construction of instruction sheets for the school shop. These criteria have been prepared in a form which overcomes the specificity which limits the use of other sets of criteria by providing a body of working principles applicable to practically all of the various forms of written individualized instructional material in common use in present day school shops. This material has been organized in such a way as to provide both a comprehensive manual type of treatise suitable for extensive and detailed use by the novice in the preparation of this type of teaching material and, at the same time, to furnish by means of the headings and underlined sections, valuable assistance to the experienced educator in improving the quality of his instruction through the use of improved teaching materials.

2202. KAVANAUGH, WILLIAM A. *Individual Activity Assignment Sheets for Use in Industrial Arts Electrical Classes.* M. A., University of Minnesota, 1948. 130 p.

An investigation of individual instruction sheets as they have been made and used in the past in order to develop a new kind of instruction sheet with particular emphasis upon its use for industrial arts electrical classes. A study and analysis of student and instructor reactions to some sample instruction sheets of the new type.

2203. KUHL, ROBERT B. *Activity Assignment Sheets for Use in Industrial Arts Eleventh and Twelfth Grade Electronics Classes.* M. A., 1954, University of Minnesota. 137 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare a set of activity assignment sheets for use by students in advanced electronics courses.

Source of Data: Data were selected by a review of literature in the field concerning instruction sheets.

Findings and Conclusions: Activity assignment sheets which combine the best features of the operation sheet, job sheet, information sheet, and assignment sheet are of great value to electronics instructors. Students will benefit greatly from the use of activity assignment sheets in that they will be guided in selection of a project, guided through reference material, and coached in the construction work of their projects.

2204. LANDER, RALPH E. *Written Woodwork Assignments for the Northwest Junior High School, Kansas City, Kansas.* M. S. in Ind. Ed., Kansas State Teachers College, 1939. 42 p.

A proposed program for a Kansas City junior high school woodworking division. It contains written instructions, charts, plans, and the like.

2205. LIENTZ, LUCILLE BERNICE (M. A.) *Operations Sheets in Art Metal.* George Peabody College, 1934. 99 p.

The preparation of operations sheets giving and explaining the various steps necessary in making articles in art metal, for the purpose of aiding instructors of art metal work at Peabody Demonstration School of George Peabody College for teachers.

2206. MATSON, HAROLD CARL. *Teaching Aids in Mechanical Drawing.* M. A., University of Minnesota, 1940. 106 p.

An experiment to evaluate and compare textbook, assignment sheets, and wood models as instructional devices in teaching mechanical drawing.

2207. McWETHY, JOHN S. (M. A.). *Outline for Individual Instruction Sheets for 7th and 8th Grade Woodwork.* Indiana State Teachers College, 1934. 111 p.

A study which establishes a criteria for the writing of individual instruction sheets for a woodwork course in industrial arts. Manual operations as well as related technical information topics are included.

2208. MILES, ERWIN LAWRENCE (M. S.). *Visual Aids and Unit Instruction Sheets For a Course in*

Automobile Battery Ignition. Oregon State College, 1935. 101 p.

The selection and development of objective teaching aids (visual teaching devices and unit instruction sheets) for the more difficult phases of automobile ignition, especially for use in a vocational school.

2209. SAYER, JAMES A. *A Grouping of Related Activity Assignment Sheets Designed for Teaching Electricity to Rural Students.* M. A., 1954, University of Minnesota. 342 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To develop teaching-learning guides to aid in teaching electricity to farm people.

Source of Data: Data were obtained by an analysis of need and development of objectives. The assignment sheets were then developed and validated over a two-year period by the writer as a teacher for a rural electric distribution cooperative.

Findings and Conclusions: Fifty-two activity assignment sheets were developed under the following headings: basic magnetism and electricity, electric wiring for farm and home, electric motors, household appliances, farm production equipment.

2210. SCHADE, OLIVER M. (M. S.). *The Value of Instruction Sheets As a Supplement to Demonstration Methods in Mechanical Drawing.* Iowa State College, 1936. 72 p.

A comparison of the results obtained, as measured objectively, when two equated groups of high school students were taught mechanical drawing by similar means except that one group used instruction sheets while the other group did not use them.

2211. SHIPP, VERNON E. (M. S.). *Unit Instruction Sheets and a Course of Study Based* upon an *Analysis of Bench Woodworking as a School Activity.* Oregon State College, 1933. 78 p.

The thesis develops a technique of analysis and selection of subject matter suitable for use in any form of shop teaching, whether vocational or general in nature. A plan of organization and presentation of subject matter for bench woodworking at the ninth grade level is included.

2212. SLOCUM, DANIEL M. *Individual Instruction Sheets.* M. A., 1949, University of Minnesota. 119 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare a series of instruction sheets for use in teaching 10th grade general metal work.

Source of Data: Data were obtained from publications.

Findings and Conclusions: The report contains a series of instruction sheets with suggestions for their use.

2213. SMITH, HARRY L. (M. S.). *Visual Lesson Sheets for Teaching Selected Craft Units.* Oregon State College, 1940. 63 p.

The development of visual lesson sheets for teaching selected craft units based on research, study, personal contact, and experimentation. Some of the values of visual lesson sheets are indicated.

2214. SMITH, JAMES MASSON (M. S.). *Instruction Sheets on Specific Repair Work of Janitors in Public School Buildings.* Purdue University, 1933. 57 p.

The preparation of instruction sheets for each of thirty-five common janitorial repair jobs. Questionnaires and interviews served as the basis for this study.

2215. SMITH, WALTER WELLMAN (M. S.). *A Study of Instruction Sheets—Early History and Present Use.* Oregon State College, 1940. 81 p.

A study of the development of written instructional material which includes the attitudes of various teachers toward the use of written instructional material. The need for the development of more illustrative material is considered.

2216. TRANBARGER, JOHN C. (M. S.). *Practice in the Fundamentals of Printing.* Indiana State Teachers College, 1932.

The development of one hundred specific lessons in printing to be used in the training of teachers of printing at Indiana State. The material was developed on an experimental basis and tried out in the author's classes for a three-year period.

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2217. VanTASSEL, RAYMOND. *Tools for the General Shop: A Background Story of the Origin and Development of the Hand Tools Used in the Industrial Arts Comprehensive General Shop in the Junior High School.* Ed. D., 1948, New York University. 457 p. Library, New York University, New York, and Library of Congress.

Purpose: To develop a series of instruction sheets giving a short descriptive account of each tool with illustrations which will present to junior high school pupils, in an interesting manner, a background story of the origin and development of the hand tools commonly used in industrial arts comprehensive general shops in New York State.

Source of Data: Uses a jury of specialists, and the questionnaire method in selecting the most used tools in the various areas of the comprehensive general shop and investigates their origin, historical associations and development. Uses the historical and descriptive method in writing short accounts of the development of each tool selected. The descriptions are written in a vocabulary suited to 7th, 8th, and 9th grade pupils. A total of 32 questionnaires were mailed to a group of selected teachers. Replies were received from 23 persons.

Findings and Conclusions: Results indicated that seventy tools were of sufficient significance to warrant write-ups as instructional information sheets. The interpretations were in the form of brief vignettes understandable to pupils of junior high school ages. The investigator recommended that the teacher should attempt to develop an industrial arts program that will be integrated with such school subjects as social studies, science, and the language arts, utilizing the descriptive accounts of hand tools. It is his belief that an outcome of a knowledge of our heritage in tools is a better understanding of those societies that had a part in the invention and development of tools, and that knowledge may provide a better appreciation of tools. Many communities have been founded by the establishment of a tool manufacturing plant within the community. In such communities, pupils should be encouraged to study the far-reaching effects of new improvements of tools on the social and economic life of their community.

2218. WAGNER, J. ERNEST (Masters). *Job Sheets in the First Year Mechanical Drawing Instruction.* University of Pittsburgh, 1930.

2219. WOOLLEY, PAUL VERN (M. S.). *Job Sheets in Elementary Printing.* Indiana University, 1930. 141 p.

The job sheets are intended to cover all phases of printing practice as found in a one-year course of study in the junior high school print shop. The topics included in the job sheets deal with the basic operations of the trade as adapted to pupils of junior high school ages.

2220. WRIGHT, LAWRENCE S. *Individual Instruction Sheets for Industrial Arts.* M. S., 1948, The Stout Institute. 70 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To discover the need for instruction sheets, some current practices in their use. To ascertain the relative value of the basic kinds. To determine who should prepare them and to learn the types of training in the use of instruction sheets prospective industrial arts teachers should be given.

Source of Data: The writer developed an inquiry form which he sent to one representative industrial arts teacher and one representative industrial arts supervisor or administrator in each State and the District of Columbia. This sampling was made through the State departments of public instruction. A review of the available literature was made.

Findings and Conclusions: The findings indicate the following to be basic kinds of instruction sheets: The student planning sheet, the operation sheet, the information sheet, the job sheet, the assignment sheet, and the job assignment sheet. For secondary schools there was definite agreement that instruction sheets are needed as a method of instruction, that the 6 basic kinds of instruction sheets are currently in use, that each is of value and that one kind is not significantly of more value than any other kind, that teachers should prepare instruction sheets only when they are not already available. Prospective industrial arts teachers should be required to have in their undergraduate training a unit within a course or a course dealing with written instruction sheets. It was recommended that further study be made; that the use of instruction sheets be continued; that supervisors and administrators make available to their teachers everything possible in the way of good instruction sheets; that prospective industrial arts teachers be required to have instruction in the selection, preparation, and the use of individual instruction sheets; and that teacher training institutions offer such instruction to their prospective industrial arts teachers.

Production Work

2221. BAKER, WILLIAM R. (M. A.). *Production in School Print Shops.* University of Minnesota, 1936.

A survey of high school printing departments and shops in the United States to determine the extent, types, and value of production work carried on, and the comparative opinions of teachers, school administrators, and commercial print shops on production in schools.

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2222. BEDNAR, ERNEST G. *Public School Maintenance, Installation, and Construction Jobs Performed by or Under the Direction of Industrial Arts Teachers,* Ed. D., 1955, University of Missouri. 127 p. Library, University of Missouri, Columbia.*

Purpose: To ascertain the practices of industrial arts teachers in the performance of maintenance, installation, and construction jobs for the industrial arts shop and for the school, and to obtain their opinions regarding these activities.

Source of Data: Data for the study were obtained through an information form mailed to a random sample of 1,000 industrial arts teachers in public secondary schools throughout the United States. Of the 425 information forms returned, 392 were retained and the data compiled graphically and statistically for the report.

Findings and Conclusions: Industrial arts teachers performed more maintenance, installation, and construction jobs than they believe advisable due to the adverse influence upon their teaching effectiveness. Student help was used extensively for these jobs during class time and vacant periods. Teachers felt that the "do it yourself" movement was increasing the need for shop maintenance training on the secondary level. Shop teachers felt they needed more "time," "equipment," and "training" if expected to perform all maintenance and construction jobs which confront them, as well as extra pay for those done outside of school hours. Teacher training institutions should offer a required course in shop maintenance for their undergraduate industrial arts majors and a similar elective course for graduates in this field. It is false economy to use the industrial arts teacher's professional time for many of these jobs.

2223. HARRIS, SAM LAWRENCE. *A Study of Present Day Practices in Production Work in Day Trade Classes of Carpentry and Cabinet Making.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 38 p.

An account of practices in the selection and handling of production jobs in trade wood shops in Oklahoma and adjoining States.

2224. HELTON, H. L. *The Development of the Production Shop at the Oklahoma Agricultural and Mechanical College.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 38 p. Department of Trade and Industrial Education, Oklahoma Agricultural Mechanical College, Stillwater.

Purpose: To compile a record of the major jobs completed in the production shop at Oklahoma Agricultural and Mechanical College.

Source of Data: Data were obtained from shop records and personal interviews with production supervisors.

Findings and Conclusions: The shop has supplied most of the furniture for dormitories on the campus and many departments with furniture and equipment. It played an important role in the war training programs. It has provided the opportunity for many students to develop trade skills under production situations and to earn a part of their college expenses.

2225. JOHNSON, RICHARD DEAN. *Production Problems in the Industrial Arts Shop of the Teacher Education Institutions of the United States.* M. S., 1951, Kansas State Teachers College. 69 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburgh.

Purpose: To discover the organization and administration of production methods as carried on in teacher education industrial art shops in the United States.

Source of Data: Data were obtained from questionaires submitted to 162 industrial arts teacher education institutions of the United States.

Findings and Conclusions: Seventy-three per cent of the institutions studied carried on production work. In three fourths of the cases production work was done to provide the student with desirable experiences in production methods. The fields doing the largest amount of work are woodwork and printing. A large amount of the production work was done by students in class. In over fifty per cent of the institutions the factory or production method was checked as having educational and social values.

2226. JOHNSON, SHELVY E., Jr. *The Tooling-Up Phase of Mass Production Jobs in Industrial Arts Instruction.* M. Ed., 1955, University of Maryland, 44 p. Department of Industrial Education, University of Maryland, College Park.

Purpose: To establish a criteria for the selection of jobs suitable for line production in the industrial arts shop, to select appropriate jobs, and to develop the essential jigs and fixtures for these jobs.

Source of Data: The development centered about a representative job in each of three areas: wood, metal, and plastics.

Findings and Conclusions: The tooling needs of each job were analysed and then the tools were designed and constructed. The metalworking job was carried through with a ninth grade class. All of the tools are shown pictorially. The line production job is presented as a short-term method of instruction.

2227. SCHWOB, MARION LYON (Masters). *Construction of Play Equipment by Manual Training Classes.* University of Southern California, 1935.

2228. SCOTT, CHRIS N. (M. S.). *Production and Maintenance Work As Industrial Arts Content.* Iowa State College. 1938. 75 p.

A study on the following problems related to production and maintenance work in the industrial arts department: (1) To what extent is it a part of the curriculum? (2) Does it provide valuable industrial arts content? (3) Do laboratories provide economic facilities? (4) Can it be adapted to the industrial arts curriculum? (5) Does it displace other desirable industrial arts content?

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2229. TAGGART, LEO R. *Principles and Practices in the Use of Productive Work in the Public Vocational Schools.* Ed. D., 1953, University of Pittsburgh. 185 p. Library, University of Pittsburgh, Pittsburgh, Pa.

Purpose: To develop a list of guiding principles and practices in the use of productive work in the public vocational schools.

Source of Data: Data were obtained by a check list consisting of 222 principles and submitted to 13 state officials, 84 administrators and 222 shop instructors in the Commonwealth of Pennsylvania.

Findings and Conclusions: Findings resulted in 114 guiding principles which received acceptance. The extent of practice was determined. The principles were ranked within the general classifications of Administration and Supervision, Curriculum, and Finance.

Safety

2230. ANDERSON, JOHN W. *Safety Education in High School Machine Woodworking Shops.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 62 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain ways of improving the safety program so as to reduce accidents on power woodworking machines used in industrial arts shops.

Source of Data: Data were secured from check sheets sent to woodworking instructors in four year, class A, Kansas high schools with enrollments of 120 or more.

Findings and Conclusions: More accidents were associated with the circular saw and jointer than any other machine. Major causes of accidents reported were unguarded machines, not using machine guards, diversion of student's attention, and lack of safety program.

2231. BAROCCI, L. F. (M. S.). *Safety in the School Shops.* The Stout Institute, 1939. 125 p.

A compilation of safety rules for use in the industrial arts school shops, based on a survey of machine manufacturers, state safety councils, and insurance companies. Rules are classified for use as a safety handbook in various areas of a shop.

2232. BEGNAUD, EDWARD MARSHALL. *A Recommended Safety Program for the Mabry Foundry and Machine Company and Iron Castings Incorporated of Beaumont, Texas.* M. S., 1954, Agricultural and Mechanical College of Texas. 234 p. Industrial Education Department, Texas

Agricultural and Mechanical College, College Station.

Purpose: To develop a basic program of safety to decrease accident frequency and/or severity rates of the Mabry Foundry and Machine Company and Iron Castings, Incorporated of Beaumont, Texas.

Source of Data: Data were obtained from books, periodicals, learned journals, and personal conferences.

Findings and Conclusions: Steps recommended for the installation of a basic safety program: program organization, selling safety to management, selling safety to the supervisors, educating supervisors to safety, thorough plant inspections, elimination of existing mechanical hazards, provide desirable personal protective equipment, make general announcement of program, begin safety education of workmen, formation of safety committee, consider possible changes, and continuing the safety program.

2233. BEGUHN, B. A. (M. S.). *A Study of Shop Accidents in the Secondary Schools of the Counties in the State of Maryland.* The Stout Institute, 1944. 70 p.

By surveying the superintendents and teachers in twenty-four counties of Maryland, the author determined the kind and number of accidents in secondary school shops and made recommendations for reporting and recording such accidents.

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2234. BIRNBACH SIDNEY B. *A Comparative Study of Accident-Repeater and Accident-Free Pupils.* Ed. D., 1948, New York University. 113 p. New York University Library, New York, and Library of Congress.

Purpose: To explore measurable psychophysical aspects existing among students who have repeated accidents and those who do not have accidents.

Source of Data: Selected children in one school who were considered accident repeaters and another group who were accident free. Tests and examinations were administered to find differences in adjustment, attitude toward safety, gymnastic ability, and physical fitness.

Findings and Conclusions: Accident-free groups excelled in knowledge of safety, growth in personal and social relationships, and were generally better adjusted. The pupils in the accident repeater group excelled only in greater crude strength and superior gymnastic ability.

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2235. BURGHARDT, WILLIAM F. *Safety Education in the Teachers Colleges of West Virginia.* Ed. D., 1950, New York University. 282 p. Library, New York University, New York, and Library of Congress.

Purpose: To evaluate the status of safety education in the State of West Virginia in contrast to the rest of the nation. To ascertain the need for safety education as a basis for establishing an effective program of safety education.

Source of Data: A study was made of the vital statistics of both West Virginia and the nation including the status of instruction. The study was made through questionnaires sent to both public and private schools, agencies, and colleges of West Virginia including other States in order to get their teacher training programs and laws.

Findings and Conclusions: The most effective job was at the elementary level, although there is a need for it at all levels. Death rates in States with good programs of safety education were lower than the national average. These were New York, Pennsylvania, Illinois, and West Virginia. The same type of accidents occur in West Virginia as in the rest of the nation. Railway, mine and quarry accidents as well as fires were higher in West Virginia than in the rest of the nation. Car, trucks and falls caused less deaths than were expected. The national death rate was 72.7/-100,000 as compared to 67/100,000 in West Virginia.

2236. BYRON, EVERETT ARTHUR. *Safety Factors of Driving Technique the Industrial Arts Teacher Should Stress in Driver Education Courses.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 140 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To evaluate accident causation in terms of safe driving techniques to stress in driver education courses.

Source of Data: Accidents were classified into 5 types as recommended by the National Safety Council and the Colorado Motor Vehicle Department. Check sheets were sent to 500 drivers involved in accidents.

Findings and Conclusions: Items being contributory to causation of accidents were: Driver attitude; inattention, fatigue, traffic violations, skidding, speed, and obscurement of vision.

2237. CARLE, ROBERT ANDREW. *Safety in the School Shop.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 41 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To provide a guide for the shop instructor in implementing a safety program in the school shop and to make a contribution for a proposed shop teacher handbook.

Source of Data: The material was a partial consolidation of safety information given in various bulletins of the National Safety Council, newsletters, educational textbooks, and handbooks of departments of education in several States.

Findings and Conclusions: The success of a safety program will depend upon the integration of a well-planned safety program into the shop curriculum. Safety habits are acquired through frequent practices of safe and correct working methods on the part of students. Positive methods of instruction should be employed in the teaching of safety. Planning the safety program is the responsibility of the shop teacher and must be adapted to the local situation.

2238. CHULTS, CHAUNCEY S. *An Analysis of Safety Guards on Woodworking Machinery.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 101 p.

A description and analysis of effective safety guards with specifications for their manufacture for woodworking machines.

2239. COVEY, ALVIN EARL (M. S.). *A Study of Safety in the Industrial Arts Woodworking Departments of the Public Schools of Texas.* A & M College of Texas, 1938. 82 p.

A survey of safety problems and practices found in industrial arts woodworking shops, with recommendations for improvement.

2240. CRABB, WILLIAM HARVEY. *Safety Practices in Rural High School Woodworking Shops.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 72 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine desirable steps in a program of safety instruction in rural school shops.

Source of Data: An accident report blank was developed after which a check sheet was formed based on number of accidents, type of accidents, condition of room, safety instruction used. Each of twenty-one rural high schools was checked against this form.

Findings and Conclusions: Safety practices studied in eighteen rural high schools indicated that few shop teachers kept adequate records on accidents. Also safety instruction was limited in scope. The condition of the shop and safety instruction were paralleled by accidents in the shop. The schools ranking low in these respects had a high rate of accident, while ranking schools had fewer accidents.

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2241. CRESSMAN, PAUL L. (Ed. D.). *Safety Education in Pennsylvania Industrial School Shops.* Pennsylvania State College, 1934. 141 p.

An investigation of the accidents in the school shops of Pennsylvania for the school year, 1933–1934. Forms for an objective means of reporting safety data are developed.

2242. CROSS, HAROLD A. *Safe Work Practices Emphasized in the Printing Industry.* M. Ed., 1954, Wayne University. 57 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To develop a supplementary text to cover all phases of accident prevention in a print shop.

Source of Data: Data were obtained from personal experience, interviews with printers, and various theses.

Findings and Conclusions: This report contains a description of safety problems and practices involved in a school print shop and in commercial printing shops.

2243. DALE, GEORGE BENTON (M. A.). *Dust Recovery in the School Laboratory with Special Reference to Safety and Health.* Ohio State University, 1937. 162 p.

An investigation of the hazardous dusts created in industry and in school laboratories. Methods and equipment which will control these hazards are suggested. Pictures of devices used in dust control are included.

2244. DAVIS, CARLIS COY (M. S.). *An Analysis of General Safety Education for Industry and Vocational Schools with Specific Recommenda-*

tions for Wood and Machine Shops. North Texas State College, 1943. 147 p.

A study of the development and operation of safety education in industry and school shops, with recommendations for an improved program in the school. It traces the origin and development of safety concepts in industry and in school shops to 1942.

2245. **DUDLEY, STANLEY ARTHUR.** *A Study of the Industrial Arts Safety Conditions in the County and City Public Schools of Yakima, Washington.* M. Ed., 1953, Central Washington College of Education. 93 p. Library, Central Washington College of Education, Ellensburg.

Purpose: To compare safety conditions and practices existing in the high school industrial shops of Yakima County with research findings on school shop safety.

Source of Data: Data were secured from research reports, books, personal experience, interviews, and the history of industrial arts in Yakima County.

Findings and Conclusions: Many shops in Yakima County are far below the recommended minimum standards. Recommendations are given as to how these standards can be brought up.

2246. **DUPIN, HUBART W. (M. S.).** *Safety in the School Shop.* Western Kentucky State College, 1945. 70 p.

A study of safety committee reports and the methods of installing safety rules. It includes the rules and regulations governing the use of machines, tools, and equipment. Measures taken by supervisors, instructors, and boards to reduce accidents are recorded.

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2247. **ESTABROOKE, EDWARD C. (Ed. D.).** *Safety and Health Instruction and Practice in School Shops.* Pennsylvania State College, 1939. 238 p.

A study of health and safety instruction practiced by 272 industrial arts teachers and 70 vocational industrial teachers in Pennsylvania school shops. A large number of items dealing with safety and health instruction in shops were checked to discover those phases being taught, those not taught but recommended, and those not recommended.

2248. **FILLINGHAM, WALLACE F.** *A Study of Safety Education in Secondary School Shops (Grades 7–12) in Southwestern Michigan.* M. A., 1953, Western Michigan College of Education. 52 p. Library, Western Michigan College of Education, Kalamazoo.

Purpose: To ascertain the status of safety education in school shops of Southwestern Michigan; to learn what teaching methods and devices are most commonly used; to identify the most common policies in handling accidents in school shops, and to provide information for safety education programs in teacher training institutions.

Source of Data: Data were obtained from a questionnaire sent to one hundred forty industrial arts instructors in Southwestern Michigan.

Findings and Conclusions: Most school shop instructors teach safety by means of integrating it with the other shop topics and materials. They use the lecture technique in teaching safety and follow a policy of periodic safety inspection. The circular saw, band saw, and the jointer were reported by a great majority of the instructors as not being used by seventh and eighth grade students.

2249. **FREEMAN, JAMES WOODROW.** *Certain Psycho-Sociological Factors of Accident-Free and Accident-Liable Automobile Drivers of Cedar Rapids, Iowa.* M. S., 1952, Iowa State College. 55 p. Library, Iowa State College, Ames.

Purpose: To ascertain the differential in personal and psycho-sociological factors between two groups of drivers in Cedar Rapids, Iowa.

Source of Data: Data were obtained from 40 drivers; 20 judged accident free for five years and 20 who had experienced two or more accidents during the previous year.

Findings and Conclusions: The personal inventory indicated that two scales would predict the accident-liable driver: the dominance-submission and the radicalism-conservatism.

2250. **FREY, RICHARD E.** *Reaction Time Under Conditions of Preoccupation With and Without a Warning Signal.* M. S., 1951, Iowa State College. 56 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effect of preoccupation and a warning signal on reaction time.

Source of Data: Forty-eight subjects were preoccupied with executing a task of driving a simulated automobile. The stimulus used was a toy train emerging from a tunnel 24 times with a warning and 24 times without a warning. Recording was made by standard instruments.

Findings and Conclusions: Preoccupation lengthens normal reaction time. A warning signal has greater effect upon reaction time without preoccupation than with preoccupation.

2251. GANNAWAY, RICHARD E. *A Proposed Course of Study in Safety for Industrial Education Students.* M. S., 1953, University of Tennessee. 95 p. Library, University of Tennessee, Knoxville.

Purpose: To develop a course in safety for students of industrial education.

Source of Data: Data were secured from textbooks on industrial safety, publications on industrial education and from reports of various school systems.

Findings and Conclusions: Detailed plans were presented for organizing and administering a school shop safety program. Typical sets of general safety rules for all shops were given and discussed.

2252. GEBBY, RUSSELL A. (M. Ed.). *Score Card for Safety Factors in School Machine Shop.* Colorado A. & M. College, 1948. 77 p.

The design of a score card for evaluating the physical factors affecting safety in Class B machine shops of lower Michigan.

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2253. GILLILAND, LONNIE, Sr. *Practices in Safety Education in the Public Schools of Selected Cities in the United States.* Ed. D., 1955, University of Oklahoma. 212 p. Library, University of Oklahoma, Norman.

Purpose: To ascertain the present practices employed in conducting safety programs in the public schools of selected cities.

Source of Data: Data were secured from chief of police in each city, superintendent of schools in each school, and the fire-exit drill regulations of each school.

Findings and Conclusions: Most school systems have a program in safety education and several different teaching methods were being employed. Many inadequacies in protection for children in the proximity of schools existed. Fire-exit drills and accident reporting need to be improved.

2254. GJESTSON, MATHEW E. (M. S.). *Safety in the Use of Woodworking Power Machinery.* The Stout Institute, 1940. 141 p.

A survey of eighty-five industrial arts teachers in the United States to set up minimum age and grade level requirements for student operation of various woodworking machines. Woodworking machines are ranked in order of their danger of operation.

2255. GRAMAN, H. R. *Content of a Manual in Fundamental Machine Shop Safety for Vocational Schools.* M. Ed., 1948, University of Cincinnati. 443 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To compile material for a machine shop safety manual for use of instructors and students in vocational machine shops.

Source of Data: Data were secured from teachers of vocational machine shops in Ohio, employee pamphlets, from safety manuals and other materials from industrial plants, from insurance companies, the National Safety Council, and from records and bulletins of the Industrial Commission of Ohio, reports of the National Education Association, books, magazines.

Findings and Conclusions: Facts on safety in the machine shop are summarized. The study indicates a need for changes in safety education in vocational machine shop programs with emphasis on equipment, the development of habits, skills and attitudes, and the elimination of hazards.

2256. GRIFFITH, H. O. (M. S.). *Evaluation of a Course of Study in Safety for the School Print Shop.* The Stout Institute, 1944, 65 p.

The preparation of a course of study for school print shop safety, based on data from State safety codes, insurance companies, and safety organizations. The study is validated by the opinions of tradesmen and printing teachers.

2257. GRIFFITH, PAUL E. *A Photographic Technique for Teaching Safety with Special Reference to Safety in Upper-Level Auto Mechanics Laboratories.* M. S. in Ind. Ed., Kansas State Teachers College, 1948. 36 p.

A description of a series of slides showing hazards in auto mechanics shops, with suggestions for their use in a safety program.

2258. GUBBY, RUSSELL A. (M. Ed.). *Score Card for Safety Factors in School Machine Shop.* Colorado Agricultural & Mechanical College, 1948. 77 p.

The design of a score card for evaluating the physical factors affecting safety in Class 3 machine shops of lower Michigan.

2259. HALL, SAMUEL F. (M. S.). *Safety Conditions in Industrial Arts Woodworking in the St. Louis Area.* Iowa State College, 1938. 63 p.

An investigation of woodworking shops of thirty-three senior high, junior high, and elementary schools in the St. Louis area to analyze existing conditions concerning school shop safety.

2260. HORNUNG, ALFRED W. (M. S.). *An Accident and Safety Educational Program for Industrial Arts Shops of Texas and Other States.* Colorado Agricultural & Mechanical College, 1936. 70 p.

A study to determine the needs of a training program for accident prevention and safety education in relation to hand tools and power machines in the industrial arts shop. The survey included 160 cities. A plan for safety training for the industrial arts shop based upon the program of industry is included.

2261. HOWARD, EDWIN E. (M. S.). *A Study of Safety and Accident Prevention in School Shops and in Industry.* Pennsylvania State College, 1931. 73 p.

A study to determine what has been done in the various states to prevent accidents in the school shops and in industry. Safety practices to be used in school shops are recommended.

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2262. HUGHES, WAYNE PHILO (Ed. D.). *Safety Procedures in the School Shop.* New York University, 1942. 396 p.

An analysis of the investigations on safety conditions and practices in the industrial arts and vocational shops since 1925 in nearly every state and from a variety of types and sizes of towns.

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2263. HUMBLE, MILFORD KEITH (Ph. D.). *Practices and Provisions for Protecting Pupils in School Shops.* University of Missouri, 1937. 175 p.

An investigation of safety practices, safety provisions, and protection afforded pupils in school shops in the United States. Topics included are methods for safeguarding mechanical and physical equipment, safety practices for the prevention of accidents, and financial protection afforded injured pupils.

2264. HYDE, HARVEY N. (M. Ed.). *A Program of Safety Education for L'Anse, Michigan, Industrial Arts Shops.* Colorado Agriculture & Mechanical College, 1947. 69 p.

A study of how to prevent accidents and to instill a sense of safety consciousness in students. Sets of safety rules for shop activities are set up, and a plan for their use is suggested.

2265. JUDY, WAYNE M. (M. S.). *Accidents and Safety Education in the Industrial Arts Shops of Iowa.* Iowa State College, 1932. 37 p.

An analysis of the number, nature, and causes of machine and hand tool accidents, as well as first-aid methods found in the several school shops represented.

2266. KECK, LEWIS E. (Masters). *School Shop Accidents and Their Prevention.* Ohio State University, 1933.

2267. KISNER, OLIVER RICHARD. *Purchasing Physical Equipment for the Woodworking Shop Safety Program.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 120 p.

This study lists and analyzes the available safety guards for use on woodworking machines. Some attempt is made to rate these guards as to effectiveness and to develop principles controlling the construction of guards.

2268. KRANZUSCH, RAY F. (M. S.). *The Development of an Instructional Test in Shop Safety.* Iowa State College, 1941. 56 p.

A test developed from illustrations of safe, unsafe, or irrelevant shop practices as judged by faculty members and graduate students of Iowa State College.

2269. LEGG, JOHN EARL. *A Study of Safety in the Secondary School Shops in the State of Texas.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 51 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the methods and practices used and the extent to which safety education is being taught in the industrial arts shops in the secondary schools of Texas, and to discover the type, nature, and cause of accidents most common in the various shops.

Source of Data: Data were obtained from books, periodicals, letters, and questionnaires.

Findings and Conclusions: Many hazardous conditions exist that should be corrected immediately. Emphasis should be placed on safe practices in the use of hand tools and machines known to present the greatest hazards. An organized system of keeping accurate accident records is needed. Forty-three per cent of the instructors who cooperated in the study do not keep such records.

2270. LONG, ROY JOHN. ***Safety Measures for Woodworking Shops in Nebraska High Schools.*** **M. A., 1953, University of Nebraska. 74 p. Library, University of Nebraska, Lincoln.**

Purpose: To ascertain the number and severity of injuries sustained in a selected group of Nebraska High School woodworking shops, and to make recommendations for the prevention of injuries.

Source of Data: Questionnaires were sent to 78 selected Nebraska high school woodworking shops. Literature on safety and safety regulations was reviewed.

Findings and Conclusions: Most injuries were caused by hand tools. Although there were fewer accidents while using machinery, these accidents were more serious in nature.

2271. LUSK, MARY KATHERINE. ***A Proposed Course in Industrial Hygiene and Safety in an All-Day Trade School Program.*** **M. S., 1950, University of Tennessee. 126 p. Library, University of Tennessee, Knoxville.**

Purpose: To prepare a proposed course in Industrial Hygiene and Safety designed to comply with basic vocational education regulations; to serve as an aid in promoting desirable work habits and attitudes; and to help prepare the student for effective entry into a specific trade or occupation with proper emphasis on accepted safety practices.

Source of Data: Data were secured from publications made available through the National Safety Council, handbooks of local industries, Hygiene and Safety textbooks, Vocational Education textbooks, bulletins issued by the Federal Government, safety posters and charts, and office files of the Stair Technical High School and the Knoxville Health Department.

Findings and Conclusions: Instructional units were compiled for the proposed course covering 4 years. First year covers 54 hours; 3 hours per week on alternate weeks for 36 weeks. Second, third, and fourth years cover 36 hours; 2 hours per week on alternate weeks. In general, in each year's course 10 units are devoted to safety and 5 units to hygiene. The course in the first 2 years develops in the student safe work habits and attitudes in general. Third year course covers safety and hygiene in one particular shop; fourth year relates to advance study in actual practices in industry. Ultimate objectives are to secure negative results—accident prevention. The safety program of the Stair Technical High School has been placed on the Honor Roll of the National Safety Council for 2 consecutive years. Results obtained are interpreted as a definite justification of organized safety training in a vocational high school. Appendix includes questionnaire, report of injury, safety award, units of instruction, information sheets, safety precautions, evaluation check list, and copy of "Honor Roll" of National Safety Council.

2272. MADDEN, RUPERT GERALD. ***Safety in the Industrial Arts Shops of Louisiana.*** **M. S., 1953, Louisiana State University. 119 p. Library, Louisiana State University, Baton Rouge.**

Purpose: To ascertain the phases of safety being taught and the improvements needed in the safety programs in the industrial arts shops of Louisiana.

Source of Data: Data concerning the shop building, fire control measures, methods of guarding machinery, teaching and devices, and accidents in the shop during the 1950–51 and 1951–52 school years were obtained from seventy-seven of the 114 white shop teachers in Louisiana.

Findings and Conclusions: Small shop buildings was a contributing cause of accidents. Improper storage facilities for flammable materials, and insufficient quantities and types of fire extinguishers were found in over one-half of the shops. Improper use of the jointer and circular saw caused almost one-half of the accidents.

2273. MARTIN, ROBERT A. (Masters). ***A Study of Reported Accidents in the Detroit School Shops from 1938 to 1944.*** **Wayne University, 1945.**

2274. McALLISTER, VIRGIL E. (M. S.). *Accidents and Precautionary Measures Taken in Woodwork Shops of Northern Illinois Schools.* Iowa State College, 1941. 46 p.

A survey of thirty-three schools in Northern Illinois in which there were 1031 boys using power machinery to find out the number of accidents that occurred in two years and to investigate the safety methods used in these shops.

2275. McCORD, HAROLD C. (Masters). *Safety Education Concerning the Automobile Including the Development of Content for Industrial Arts Classes.* Ohio State University, 1934.

2276. McGUIRE, W. M. (M. S.). *Accident Prevention in High School Shops.* Oklahoma A & M, 1936. 103 p.

A set of rules for accident prevention, with application to the school shops. The causes and extent of accidents in high school shops from 1932 to 1936 are investigated.

2277. McQUIGG, MARION L. *Fire, Safety, and Protection as Related to the Industrial Arts Shop.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 101 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To establish fire protection as a phase of all industrial arts courses.

Source of Data: Data were obtained from the college library, material from national fire protection organizations, visits to the State Fire Marshal, and the Texas Fire Insurance Department, Austin, Texas.

Findings and Conclusions: It is the responsibility of the industrial arts instructor to correlate fire extinguishment with the shop program in such a way that through these experiences students may obtain proper attitudes toward fire protection and fire safety.

2278. MORRISON, DON HOWARD. *Elements Involved in Designing a Dust Collecting System for the Industrial Arts Shop.* M. Ed., 1954, Agricultural and Mechanical College of Texas. 30 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To identify the elements involved in designing a dust collecting system for the industrial arts shop.

Source of Data: Data were secured from magazines, books, pamphlets, and literature obtained from companies producing dust collecting equipment.

Findings and Conclusions: A thorough examination should be made of all the various parts of a dust collecting system such as the collector, blower and its drive. Also, a study should be made of the various hood forms used in designing a duct system.

2279. NICKLAS, GEORGE. *A Safety Education Program for the School Machine Shop.* M. S., 1951, Stout State College. 134 p. Library, Stout State College, Menomonie, Wis.

Purpose: To investigate, through the use of documentary evidence, the factors involved in preparing a safety education program for the school machine shop.

Source of Data: Data were obtained from existing studies of safety education for the machine shop.

Findings and Conclusions: The accident-recording system is the basis of prevention work. A good safety program depends mainly upon a safe environment to aid in forming safe habits and practices during the formative years of the student, and on the attitudes of teachers and students toward better safety in the school machine shop.

2280. NOE, FREDERICK J. *A Survey of Safety Publications for Industrial Arts Education.* M. Ed., 1953, Wayne University. 30 p. Department of Industtrial Education, Wayne University, Detroit, Mich.

Purpose: To collect and evaluate literature and material pertaining to safety in the wood shop.

Source of Data: Data were secured by reviewing similar studies and from a letter requesting material from selected publishers.

Findings and Conclusions: A large number of publishers list material for safety, but little of it is applicable to safety in the wood shop. It is recommended that those interested in safety examine the literature available.

2281. PEDERSON, WALFRED L. *Safety Instructions.* M. A., University of Minnesota, 1942. 93 p.

A study of current methods of safety instruction and of the responsibility of accidents to students in the industrial arts departments of 30 Minnesota schools.

2252. FYTCHER, LAURENCE (M. S.). *A Study of Safety Education in the California Secondary School Shops with Recommendations.* Oregon State College, [illegible]. 99 p.

A review of safety programs in California high schools during the period [illegible]. Recommendations for setting up a safety program by the beginning shop teacher are offered.

2253. ROEHRING, CHARLES O. (M. A.). *The Needs for Safety Training in the Vocational School for the Electrical Trade.* University of Pittsburgh, [illegible]. 77 p.

A study to discover the hazards in electrical work in both school and industry and to determine the safety instruction that should be given to reduce dangers most effectively.

2254. SCHAEFER, RALPH H. (M. S.). *A Study to Determine a Safety Program for Industrial Arts Shops.* Colorado Agricultural & Mechanical College, [illegible]. 80 p.

A study of safety in high school shops. Safety rules to be used in a safety program are listed.

2255. SCHINDLER, ROBERT D. *Safety in the School Shop.* M. Ed., 1949, Agricultural and Mechanical College of Texas. 87 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To ascertain methods of preventing accidents by influencing ideas and beliefs in the school shop.

Source of Data: A study was made of the writings of men with long experience as active workers or teachers in the field of safety education, and the relationship between beliefs and accidents was observed in the statistical data of accident reports.

Findings and Conclusions: Prevention of accidents can be best accomplished by influencing ideas and beliefs through constant education, with constructive and positive faith in work and deed.

2256. SCOTT, GUY ADAMSON. *Safety in the Industrial Arts Shops of Middle Tennessee.* M. A., 1950, Middle Tennessee State College. 67 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the extent to which safety programs were being carried out in the industrial arts shops of Middle Tennessee.

Source of Data: Data were secured through questionnaires and visits to industrial arts shops of Tennessee.

Findings and Conclusions: Many Middle Tennessee industrial arts shops are operating under conditions which are not safe. Many shops are housed in rooms and buildings not originally intended for industrial arts use.

2257. STEPHENSON, LESLIE EARLE. *A Discussion of School Shop Safety Activities.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 104 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile data that may help the eventual production of a national school shop safety program similar to the one being followed by most industrial organizations.

Source of Data: The ideas in this report were obtained from an extended study of textbooks, safety magazines, safety reports, theses, pamphlets and other related material, as well as those extracted from talks by authorities in the field of safety education.

Findings and Conclusions: The responsibility for safe practices is a joint responsibility of school officials, instructors, and students. The basic feeling of responsibility for safe practices should be developed by the instructor but the qualified student should assume responsibility for assisting in developing the safe practice habit among the other students.

2258. STONE, RAY D. *Accidents and Their Causes in Selected Industrial Arts Shops of Iowa.* M. S., 1950, Iowa State College. 63 p. Library, Iowa State College, Ames.

Purpose: To ascertain the causes, types, and frequency of accidents in Iowa industrial arts courses, and to provide a stimulus for a state-wide safety program.

Source of Data: Data were secured from accident reports from the instructors of [illegible] industrial arts courses in Iowa.

Findings and Conclusions: A total of [illegible] accidents were reported by [illegible] instructors; [illegible] per cent were caused by hand tools, [illegible] per cent caused by power tools, [illegible] per cent caused by handling materials, [illegible] per cent due to miscellaneous causes. Cuts and lacerations were the most common accidents. The most dangerous time of day was from [illegible] a.m. Student carelessness was given as the primary reason for most accidents. The most hazardous area was auto mechanics, with an average of 7.58 accidents per shop.

2289. SUPPLEE, ELAM JACKSON (M. A.). *Safety Instruction in the Industrial Arts Wood Shop.* University of Maryland, 1948. 117 p.

An investigation of the areas in the school wood shop which constitute safety problems and in which safety instruction is needed. Specific safety instruction procedures are given.

2290. THIESSE, SYLVAN HERMAN. *Accidents and Safety Education in the Industrial Arts Shops of Northwest Iowa.* M. A., 1950, University of Minnesota. 50 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To analyze the number, nature, and causes of machine and hand tool accidents in the industrial arts shops and the amount of safety education being offered.

Sources of Data: Data were obtained from questionnaires returned by industrial arts instructors of northwest Iowa.

Findings and Conclusions: Power tool accidents reported exceeded the hand tool accidents. Although 23 per cent of all accidents reported needed the services of a physician, no fatal accidents were reported. Student carelessness and disobedience of rules were the main causes of the accidents. Safety education is practiced to some degree in all schools.

2291. THOMSON, WALTER. *Practices Used For Eye Protection.* M. Ed., 1952, Wayne University. 80 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To report the existing practices used for eye protection in the Detroit metropolitan area shops and those practices recommended by others in the field of industrial education.

Sources of Data: Data were obtained by a questionnaire sent to eighty teachers of industrial arts in the State of Michigan.

Findings and Conclusions: The teachers surveyed, as well as others in the field, have taken a positive attitude toward the use of eye protection in the school shop. The extent of eye protection for some machines or operations is often defined by certain boards of education but the majority are left to the discretion of the shop teacher.

2292. TURNER, FINIS (M. S.). *A Study of Accidents and Their Causes Occurring In Industrial Shops in the Public Schools of Texas and the Methods Used to Teach Safety Education in Industrial Arts Programs.* North Texas State College, 1948. 50 p.

A study of accidents occurring in industrial arts shops with reference to their underlying causes and how they may be prevented through safety education.

2293. VANOVER, HOWARD LEE. *Safety in Fifty-five Industrial Education Shops in Montana.* M. A., 1949, Iowa State College. 104 p. Library, Iowa State College, Ames.

Purpose: To examine the existing safety conditions in 55 school shops in Montana, and to classify factors which have to do with safety.

Sources of Data: Fifty-five school shops in Montana were selected for this investigation. The shops were located in 34 towns of 33 counties. A personal visit to the instructor and his shop under actual teaching conditions was made. Data collected by means of a check list.

Findings and Conclusions: Safety conditions in many school shops in Montana need attention and improvement. Thirty-one percent of the shops averaged more than 18 pupils in each class. The main floor space per pupil varied from 22 square feet to 700 square feet. Thirty-three percent has space less than 50 square feet per pupil. Sixty percent of the instructors indicated that their shops were crowded. Fifty-one percent of the shops had automatic temperature control. Exhaust fans were used in 7 percent of the shops. Color dynamics were employed in 13 percent. Only 2 percent had marked danger zones, and 4 percent had means to prevent slipping at the machines. The lecture method was used on safety in all the shops. Oral instructions for the use of hand tools were given in 80 percent of the shops. Rules, posters, projected visual aids, and safety tests were used in more than 50 percent of the shops. Parental permission cards were used in 15 percent of the shops.

2294. WILD, LEWIS ELBERT (M. S.). *Evaluation of Safety Factors in the Industrial Education Shops of Davenport.* Iowa State College, 1948. 131 p.

A study to apply the following measures of safety to the industrial education shops of the Davenport schools: Iowa School Code, Iowa Industrial Code, Wisconsin Industrial Code, Industrial Safety Standards.

2295. WALFRON, DALE VIRGIL (M. S.). *Visual Education as an Aid to Safety Instruction in the General Shop.* Oregon State College, 1942. 63 p.

A survey of the safety instruction practices in the school shops of California. It includes a practical method of producing film strips for safety education. Safety manuals, safety tests, and pictures for film strips for much of the equipment of the school shop are included.

2296. WATSON, ARTHUR WILFORD (M. S. in Ed.). *A Study to Determine the Causes and Prevention of Accidents Occurring in the Secondary School Shops of Los Angeles.* University of Southern California, 1937. 118 p.

A study of the reports of 396 shop accidents in the school shops of the Los Angeles area as to cause and methods of prevention, liability, and titles.

Student and Teacher Grading, Rating Scales, Forms, Progress Records and Reports, Accounting and Guide Sheets

2297. AGNEW, BOBBY L. *The Use of Rating and Quality Scales in Evaluating Industrial Arts Projects.* M. S., 1954, Kansas State Teachers College. 52 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To develop a means of objectively evaluating industrial arts projects.

Source of Data: Data were obtained by library research and experimentation.

Findings and Conclusions: Project rating scales, and quality scales offer a higher degree of reliability for evaluating projects than the more subjective means of evaluation.

2298. ALSIP, Jr., BENJAMIN HARRISON. *Techniques of Observing and Rating Practice Teachers in Industrial Arts.* M. S., 1949, Louisiana State University. 103 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine reliable procedures in observing and rating practice teachers in industrial arts.

Source of Data: Data were secured from principals and instructors in 150 public secondary schools of the Southern Association having an industrial arts program and from critic teachers of the 60 universities and colleges in the Southern Association having an industrial arts department.

Findings and Conclusions: The critic teacher should furnish the practice teacher with a copy of the rating scale; should refrain from taking notes during their observation of practice teachers; should observe the students as well as the practice teacher, and should hold a conference with the practice teacher after each observation. A weekly conference should be held with all practice teachers.

2299. ANDERSON, Jr., GENE. *Progress Records.* M. A., 1952, University of Minnesota. 122 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To examine grading methods in use in the school shop, to evaluate these methods, and to offer suggestions for improving progress records.

Source of Data: Data were obtained from a documentary study of all available material.

Findings and Conclusions: A progress chart can give the instructor a more objective means of grading and give the pupils a chance at self grading. It helps in promoting better understanding between pupil and teacher. It will also serve as an invaluable aid in self criticism for the instructor and will improve the instruction.

2300. BLAMEY, KENNETH L. (M. S.). *A Study of the Grading Systems as Applied in the Industrial Arts and Vocational Industrial School Shops.* Pennsylvania State College, 1935. 80 p.

Investigation and evaluation of various characteristics that should be considered in arriving at a pupil's grade. The subject matter included is aimed primarily at giving the teacher assistance in grading the work of students in industrial arts and vocational school shops.

2301. BROWN, HAROLD H. *Grading Mechanical Drawing Plates, An Experimental Problem.* M. A., University of Minnesota, 1933. 80 p.

A documentary study of grades in mechanical drawing in an attempt to set a means for evaluating mechanical drawing plates, to construct a grading scale, and coordinate grading plates.

2302. CAPORALE, JOSEPHINE (Masters). *A Study of Grading Procedures in the Bok Vocational School.* University of Pennsylvania, c. 1935–47.

2303. CARSON, HAROLD EUGENE. *A System of Records and Accounting for an Industrial Arts Laboratory.* M. Ed., 1953, The Ohio State University. 85 p. Library, The Ohio State University, Columbus.

Purpose: To develop a system of records and accounting suitable for use in an industrial arts laboratory.

Source of Data: Data were obtained from an examination of current systems and literature from which criteria were developed.

Findings and Conclusions: A set of forms was developed, put into operation, and revised.

2304. CASWELL, WILLIAM E. (M. A.). *Selecting the Units for the Secondary School Industrial Arts Program.* Ohio State University, 1932.

An attempt to develop a technique for selecting industries that should be represented in an industrial arts department for the junior high level. A scale which will aid in the selecting of a unit is presented.

2305. COONEY, THOMAS E. *The Need For Revising The Industrial Arts Supply List For Elementary Schools in Detroit, Michigan.* M. Ed., 1953, Wayne University. 33 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain opinions of elementary industrial arts teachers of Detroit relative to the supply list provided for their use.

Source of Data: Data were obtained from a letter and forms sent to all teachers of elementary industrial arts in the City of Detroit.

Findings and Conclusions: In general, the items on the list were acceptable but the list should be revised.

2306. DEVORE, GERALD E. *A Self-Checking Sheet for the Evaluation of an Industrial Arts Safety Program.* M. S., [illegible], The Stout Institute. [illegible] p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To develop within the individual, during his school career, a proper and receptive attitude of mind toward safe living in all future experiences. (It is hoped that the safety check lists will aid in determining the weaknesses of existing programs, reduce the number of accidents and increase the amount of safety education offered in schools.)

Source of Data: A review of the literature made possible a compilation of items of importance in industrial arts safety programs. The check lists were formulated from the following items: The human element, methods of instruction, personnel plan, psychological factors, and environmental element. Self-checking sheets were prepared for each of the major shops in the industrial arts programs.

Findings and Conclusions: The check lists are comprehensive in nature and are designed to decrease accidents occurring in the industrial arts shop. The following incomplete recommendations represent the outstanding needs in solution of this problem. The author recommends that: Required courses of safety be included in all training institutions, safety be integrated in all phases of our educational program, teacher training institutions develop safety training programs, additional study be made of occurring accidents, teachers supervise all dangerous activity, and check lists be used to identify weaknesses in safety programs.

2307. DOERR, WARREN F. *The Audio Visual-Aids Program of Central High School, Columbus, Ohio.* M. Ed., 1952, The Ohio State University. 22 p. Library, The Ohio State University, Columbus.

Purpose: To develop a system for handling requests for and distribution of visual aids and equipment at Central High School, Columbus, Ohio.

Source of Data: Data were obtained through an examination of visual aids catalogs and literature on the subject.

Findings and Conclusions: A series of forms were developed that proved successful in practice. A plan for selecting and training student operators was devised.

2308. DRAGOO, ALVA W. (M. S.). *A Rating Scale for Shop Teachers.* Iowa State College, [illegible]. 58 p.

A study on the formation of a graphic rating scale for evaluating teaching efficiency in shop and laboratory subjects in industrial arts.

2309. DUCAT, ALEXANDER C. (M. S.). *A Study of the Ratings of the Class of [illegible] at Edison Technical and Industrial High School, Rochester, New York.* Cornell University, [illegible]. [illegible] p.

A survey of the ratings of 608 pupils of the 1943 class to discover the factors considered by shop and classroom teachers in rating pupils and to note the wide differences in the ratings.

2310. ELLSWORTH, CLARENCE A. (M. Ed.). *A Plan of Stock Control for an Industrial Arts Shop.* Colorado Agricultural & Mechanical College, 1947. 111 p.

A plan setting up supply control procedures and current records and forms for use in stock control.

2311. FALGREN, LEON ERNEST (M. A.). *A Study of Grading or Marking in Industrial Arts Courses: A Study of the Problem on the Secondary School Level.* Ohio State University, 1932. 134 p.

An investigation of the material for grading or marking that might be used in the industrial arts field on the secondary school level. It attempts to establish a criteria, determine traits or factors that should be used in grading, determine weights that should be given to main factors of grading, and suggest scales and profiles that may be used in making a grading system reliable and valid.

2312. FLAYER, EDWARD W. *A Check List for the Evaluation of the Use of Color in the Industrial Arts Program.* M. S., 1950, The Stout Institute. 56 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: The purpose of the study was to formulate a supervisory check list to evaluate color conditioning in the industrial arts program.

Source of Data: Survey of literature.

Findings and Conclusions: Review of the available literature showed that color has definite physiological, psychological, and safety factors that should be taken into consideration when color treating the industrial arts shop. It is hoped that through the use of the check list these factors may be more easily utilized in the proper treatment of the shop.

2313. FUGLSBY, GLEN O. *Industrial Arts Grading Factors.* M. A., 1950, University of Minnesota. 43 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To assist industrial arts instructors in the better grading of their pupils.

Source of Data: Questionnaire, 70 grading factors, for selection as preferred and for weighing as to value. Respondents were instructors in representative South Dakota secondary schools.

Findings and Conclusions: Experienced instructors consider more factors. Trend is toward more performance testing.

2314. HALL, HOWARD HILBERT. *Some Criteria for Evaluating Projects in General Woodworking.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 35 p.

A study of the evaluation of woodworking projects in school shops.

2315. HAMMES, ROMAN M. (M. S.). *The Effect of Lettering Upon the Grading of Mechanical Drawing.* Iowa State College, 1935. 72 p.

An analysis of seven different drawings copied by three draftsmen and judged by ten experienced teachers of drafting to determine the effects of lettering on the quality and value of the drawings.

2316. HANCOCK, LOUIS P. *Survey of Industrial Arts Marking Techniques Used in Montgomery County, Kansas.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 60 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain what marking techniques were used by industrial arts instructors in Montgomery County, Kansas.

Source of Data: Questionnaires to instructors and students were used.

Findings and Conclusions: The letter system of grading is most frequently used. Quality of work was the highest factor in rating. Pupils did not want the mark removed as it served as a stimulus to them to work harder.

2317. HAYNES, HAROLD A. (Masters). *Pupil Self-Rating Scales in Applied Electricity.* University of Chicago, 1950.

2318. HELM, ROBERT L. *Grading Factors in Industrial Arts at the Secondary School Level.* M. A., University of Minnesota, 1948. 80 p.

A study of differing grading systems and their effects upon pupils and classes.

2319. HOOPS, RAYMOND C. (Masters). *Factors Affecting Final Grades of Metalsmith Trainees.* Ohio State University, 1947.

2320. HOUSTON, TONY. *Current Trends in Grading Industrial Arts Students.* M. Ed., 1954, Agricultural and Mechanical College of Texas. 21 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the primary factors considered by industrial arts teachers in grading student progress, and to give the beginning teacher a plan for analyzing the problem of grading.

Source of Data: Data were secured from books, periodicals, and questionnaires from seventy-seven industrial arts teachers in Texas.

Findings and Conclusions: Five factors usually considered before deciding upon a grade are: effort, quality, quantity, knowledge, and attitude. Evaluation in industrial arts seems to deal with student achievement, standard of performance, motivation, and pupil-teacher relations.

2321. LaTONDRESSE, WALTER R. (M. S.). *A Grading Plan for Welding.* The Stout Institute, 1947. 35 p.

An experiment involving ten welding instructors to determine the extent to which instructors agree in grading welding jobs by inspection. A grading method by which instructors would more closely agree on rating trainee performance is proposed.

2322. McCORMICK, THAINE D. *Instruction and Guide Sheets for Technical and Related Information for Cabinet Making.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 224 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To prepare a list of topics of technical and related information, together with a number of instruction and guide sheets, which may be used by students and instructors of cabinet making.

Source of Data: Technical and related information topics were selected by making a trade analysis. Material was gathered by interviews with instructors and teachers.

Findings and Conclusions: No findings and interpretations reported.

2323. MENDENHALL, PAUL (M. S.). *Rating Industrial Education Teachers for Promotion and for Improvement of Teaching.* Pennsylvania State College, 1935. 140 p.

Investigates the rating of industrial education teachers in cities of 30,000 population or more in the United States from three points of view: (a) promotional rating, (b) rating for teaching improvement purposes, (c) self rating.

2324. MILLER, E. E. (M. S.). *A Study of the Grading of Industrial Arts Woodwork Projects.* A & M College of Texas, 1939. 35 p.

A study of evaluative criteria used by industrial arts teachers of Texas in grading woodworking projects, with suggestions for improved practice.

2325. MITCHELL, ROY D. *A Comprehensive Filing System for the Trade Shop Teacher.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 29 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College. Stillwater.

Purpose: To find the most satisfactory procedure in filing materials in trade shops, and to show how a teacher may file materials to facilitate accessibility, speed of location, economy of space, and permanency of materials.

Source of Data: Interviews of trade shop teachers. Study of filing systems used in industry, businesses and schools.

Findings and Conclusions: Basic principles of filing in trade shops can be altered to fit filing needs of the offices of teacher trainers and State staff. The underlying principles of filing recommended by this study can be modified to meet the needs in all areas of filing in the trades and industries.

2326. MONKS, WILBUR I. (M. A.). *A Scale for Grading the Product of Ninth Grade Mechanical Drawing in the Industrial Arts in Western Pennsylvania.* University of Pittsburgh, 1933.

A study to construct a scale which may be used by both pupils and instructors for grading the products of mechanical drawing in the industrial arts. The study is confined to western Pennsylvania.

2327. NESBITT, ROBERT D. *A Survey to Determine the Form Used In The Operation and Maintenance of an Industrial Arts Department.* M. Ed., 1953, Agricultural and Mechanical

College of Texas. 100 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain and catalog the forms used in the industrial arts departments.

Source of Data: Data were obtained from books, periodicals and letters sent to one-hundred supervisors of industrial arts in twenty states in the United States.

Findings and Conclusions: Though disagreeable and time consuming, keeping accurate records is important to the teacher and student. Records should provide a clear index of what the student has achieved, why a certain grade was earned, and a record of money and materials used.

2328. PEASE, GERALD MERRIT. *Industrial Arts Laboratory Forms for High Schools With Enrollment of Five Hundred or Less.* M. S., Iowa State College, 1939. 117 p.

A study to help determine which forms are most necessary and best adapted to the small-high-school laboratory. The study includes sample forms which may be used in small industrial arts laboratories.

2329. PECKHAM, GORDON E. *The Financing of Woodworking Projects in Class C and D Schools of Michigan.* M. A., 1952, University of Michigan. 28 p. Library, University of Michigan, Ann Arbor.

Purpose: To ascertain existing conditions and methods of financing woodworking projects in industrial arts in Class C and Class D public schools in Michigan, and to determine if possible an ideal method of financing the projects.

Source of Data: Data were obtained by a questionnaire sent to 200 industrial arts instructors in Class C and Class D public schools in Michigan.

Findings and Conclusions: In most schools incidentals such as sandpaper, nails, and glue are provided free of charge although students ordinarily pay for lumber. About one-fifth of the schools charge students for everything they use and about one-tenth of all schools require students to purchase materials outside of school. In most schools the instructor is responsible for keeping the accounts. Nearly all instructors believed that students should pay at least some part of the cost of materials used since this practice reduces waste.

2330. REICHLE, CHARLES A., *Jr.* (M. A.). *Student Personnel Records and Reports for Industrial Arts Education.* Ohio State University, 1933. 90 p.

A critical analysis of student personnel and record forms in industrial arts education in an effort to classify them according to administration, material, financial, student personnel, and instructional. The records and forms studied are evaluated.

2331. ROLL, ARTHUR F. *Objective Rating Scales for Industrial Arts.* M. Ed., 1950, Wayne University. 42 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To examine the construction of project rating scales of five types, with no attempt to validate them, and to ascertain the advantages and disadvantages of objectifying marking.

Source of Data: Data were obtained from books and periodicals. The analytical method was used.

Findings and Conclusions: Rating scales should help to obtain objectivity in marking projects. Objective ratings should represent only achievement. Project rating scales should be devised, or adopted, by the individual teacher and given a fair trial.

2332. RUEHL, PHILLIP W. (M. S.). *Sound Films for Electricity.* The Stout Institute, 1948.

The development of a student rating sheet for the evaluation of sixteen millimeter sound films. It includes the ratings (by use of the sheet) of nineteen films by students taking courses in electricity at The Stout Institute, Menomonie, Wis.

2333. SCHLUMPF, AUGUST F. (M. S.). *A Self-Rating Scale for Industrial Arts Teachers.* The Stout Institute, 1941. 38 p.

The formulation of a self-rating scale for industrial arts teachers, based on the analysis of a questionnaire survey of thirty-six superintendents and fifty industrial arts supervisors throughout the United States.

2334. THOMPSON, FRANKLIN E. (M. S.). *The Functioning of the Art Knowledge of Junior High School Pupils and Teachers.* Iowa State College, 1940.

A study in which seven judges were asked to rate nine plates of industrial arts projects from the woodworking department.

2335. TUPPER, ROBERT S. *Student Planning Sheets and Bills of Materials.* M. S., 1952, Stout State College. 85 p. Library, Stout State College, Menomonie, Wis.

Purpose: To examine the methods used by industrial arts instructors in selected schools to aid students in planning and organizing their project work.

Source of Data: Data were obtained from a review of literature and a questionnaire sent to industrial arts instructors in seven midwestern states.

Findings and Conclusions: Authors of industrial arts texts suggest the use of a standard form for the student planning sheet. A majority of the instructors cooperating in the study used a student planning sheet. Although writers of industrial arts texts suggest that instructors not handle money collected from students, it was found that over 55.2 percent of them were collecting money from students.

2336. VARGO, JOHN M. *Designing a Filing Card System for Industrial Education Teachers.* M. Ed., 1955, Wayne University. 48 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To design a simple filing system by adapting the McBee file card for use of industrial education teachers.

Source of Data: Data were obtained from supervisors of industrial education of the City of Detroit and the McBee Company.

Findings and Conclusions: The materials used in the filing system are a designed tabulating sheet and filing card, two instruction sheets, a McBee punch, and a McBee sorter.

2337. WEBER, MARSHALL J. (Masters). *The Construction of a Score Card that May Be Used in Evaluating, Improving and Constructing Industrial Arts in Small Rural and Village Junior High Schools.* Miami (Ohio) University, [illegible].

2338. WILLIAMS, DAVID. *A Recommended System of Property Accounting For School Shops.* M. S., 1955, Wayne University. 28 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To develop a system of property accounting that can be applied to a current teaching situation.

Source of Data: Data were obtained from an inspection of property accounting procedures of the Detroit Board of Education and several of its schools, from various systems of supply accounting, and from a study of property accounting as employed by agencies of the federal government.

Findings and Conclusions: While the various schools employed different methods in the mechanics of their supply procedures, the results were very effective. For any supply system to be effective it must be consistent with and parallel to the system employed by its parent organization.

2339. WINTERS, GEORGE WILLIAM. *Setting Up A System of Records and Reports For Use With Co-op Students in the Automotive Division of Central Vocational High School, Cincinnati, Ohio.* M. Ed., 1952, University of Cincinnati. 110 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To develop forms to enable coordinators of trade and industrial education programs to better supervise the employment-school relationship of part-time cooperative students in business and industry.

Source of Data: Data were obtained from reviews of duties and responsibilities of the coordinator and records and reports used in the cooperative schools of Cincinnati. An analysis of the present program was made to determine needed records and reports.

Findings and Conclusions: A series of forms, reports, charts, and records were developed to aid the coordinator in meeting responsibilities incident to his job with respect to the employer, the school, the state department of vocational education, and cooperating agencies.

Testing

2340. ADAMS, HENRY PRESTON (M.A.). *A Study to Determine the Effectiveness of Performance Tests as a Teaching Device: Their Application to Ninth Grade Drawing When Given over Short Units of Related Work.* The Ohio State University, [illegible].

An application of tests as teaching media. It describes the testing used in the ninth grade in teaching mechanical drawing, using controlled groups to measure the validity of performance tests and the effectiveness of using these tests at this age level.

2341. ATON, REN (M.S.). *Objective Architectural Drawing Tests Relating to Small House Architecture.* Colorado Agricultural & Mechanical College, 1935. 81 p.

Four objective type tests in architectural drawing. Standardization of the tests is developed because the ranked means or norms are, in general uniform for many of the schools co-operating.

2342. AYLSWORTH, WILLIAM KENNETH. *Predicting Achievement in Industrial Education at Iowa State College.* M. S. 1955, Iowa State College. 37 p. Library, Iowa State College, Ames.

Purpose: To ascertain the value of four variables for prediction of achievement of industrial education laboratory and non-laboratory courses at Iowa State College, and to develop prediction equations using the test scores found to have predictive value.

Source of data: Data were obtained from an evaluation of high school grade averages, American Council on Education Psychological Examination scores, Owens-Bennett Test of Mechanical Comprehension scores, and Kuder Preference Record Mechanical scores for 137 industrial education majors.

Findings and conclusions: Analysis of multiple regression for predicting laboratory achievement revealed that the zero order coefficient of correlation were positive and low. Analysis of multiple regression for predicting non-laboratory achievement revealed that high school mark average was the only variable to have predictive value.

2343. BAILEY, ARTHUR P. *Forecasting Graduation Probabilities for Engineering Students at the University of New Mexico.* M. S., [illegible], Iowa State College. 35 p. Library, Iowa State College, Ames.

Purpose: To determine from available data the probability of graduation for engineering students who entered engineering as freshmen at the University of New Mexico.

Source of data: The subject matter was statistical description of available data on freshmen who started in engineering in the school years of [illegible] or [illegible].

Findings and conclusions: Probability of graduation could be forecast before engineering students entered college. A more sensitive forecast could be made when using the first semester averages in combination with the three variables available before entering college. For all practical purposes the forecasting could be made just as efectively when using first semester averages alone.

2344. BAKER, RICHARD ALVIN. *Prediction of Achievement in Ninth Grade General Shop.* M. S., 1952, Iowa State College. 38 p. Library, Iowa State College, Ames.

Purpose: To ascertain the usefulness of certain factors in the prediction of achievement in a general shop course.

Source of data: Data for 110 pupils who had completed two semesters of general shop were obtained from the files of the Amos Hiatt Junior High School, Des Moines, Iowa. The regression technique was used.

Findings and conclusions: The best combination of variables appeared to be the Minnesota Paper Form Board, Bennett Test of Mechanical Comprehension and English achievement. These yielded a correlation of .5882 with the criterion.

2345. BANCROFT, JOHN F. *Differential Characteristics of Pupils Electing Ninth Grade Industrial Arts in Davenport.* M. S., 195[illegible], Iowa State College. 21 p. Library, Iowa State College, Ames.

Purpose: To ascertain the posibility of predicting the tendency to elect ninth grade industrial arts in Davenport, Iowa.

Source of data: Data were obtained for 101 boys, 70 of whom elected industrial arts and 31 who did not. Biserial correlation was used with discriminant function technique.

Findings and conclusions: The variables used held very little relationship with the criterion. The correlations established were: intelligence and eighth grade industrial arts, .2290; intelligence and eighth grade academic marks, [illegible]; eighth grade industrial arts and eighth grade marks, [illegible].

2346. BARRETT, L. S. (MS.). *To Determine the Relationship Between Visual Imagery, Drafting Achievement and Mechanical Aptitude.* North Texas State College, 1948. 42 p.

A study to ascertain the relationship existing between visual imagery, drafting ability, and mechanical aptitude based on a survey of boys studying drawing in the Crozier Technical High School of Dallas, Texas, in 1947–1948.

2347. BAXTER, EARNEST W. (M. S.). *Determination of Objective Test Content for Mechanical Drawing.* Iowa State College, 1931. 72 p.

An analysis of drawing tests to determine the kind of ability tested by the various items. Based partially on this analysis, several objective drawing tests were constructed.

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2348. BEACH, CHARLES KENNETH (Ph. D.). *A Study of Certain Factors Which Have Bearing upon the Prediction of Success in Shop Courses in a Technical and Industrial School.* Cornell University, 1941. 176 p.

An attempt to determine some of the aptitudes, traits, or abilities that may differentiate the pupils receiving high marks from the pupils receiving low marks in courses involving mechanical abilities, in an effort to establish reliable prognostic practices regarding the admission of pupils.

2349. BEAMER, RALPH K. (M. A.). *The Development of an Objective Trade Test in Automobile Ignition,* University of Pittsburgh, 1932. 68 p.

An attempt to choose a wide sampling of questions in automobile ignition that could be used as a written test for the purpose of rating automobile mechanics. An attempt was made to validate the test.

2350. BECKLY, JESSE FAE (M. S.). *Predicting Success In Engineering Drawing At Iowa State College from Senior High School Industrial Education Experience.* Iowa State College, 1948. 19 p.

An investigation of the effects of industrial education experiences in high school upon student achievement in engineering drawing in college courses.

2351. BELL, JAMES R. *Prediction of Success in Industrial Drafting.* M. A., 1949, University of California, Los Angeles. 82 p. Graduate Reading Room, University of California at Los Angeles, Los Angeles.

Purpose: To select tests most beneficial in indicating the personal characteristics and abilities related to success in industrial drafting.

Source of Data: Selection of tests was based on statistical methods. Six different tests were given to drafting classes and their correlation with other factors were computed.

Findings and Conclusions: A definite relationship seems to exist between the scores in the tests of basic drafting ability, the McQuarrie Test of Mechanical Ability and the Case Survey of Space Relations Ability, and success in drafting. It seems possible that success in drafting can be predicted by the use of these tests. These data should not be used to limit those applying for admission to classes but should be used as an additional source of information.

2352. BESTALL, JOHN BOLTON (M. Ed.). *Standards of Attainment in Senior High School Welding.* University of Southern California, 1946. 65 p.

An attempt to set up standards of performance for nonvocational welding classes in the senior high school and to develop an objective means of determining to what extent these standards are met.

2353. BLY, ERVIN W. *Test Items for the Graphic Arts.* M A., 1950, University of Minnesota. 177 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare a selected list of test items of various types to be used in the teaching of graphic arts courses in industrial arts.

Source of Data: Collecting items from many sources, analyzing them and preparing a selected list in view of course aims.

Findings and Conclusions: Shop teachers have real need for a list of objective items when making their own test.

2354. BOLLENBACK, ADOLPH C. *Tests for Service Station Attendants.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 39 p.

A series of tests to measure the degree of accomplishment at any point in the training of diversified occupations students preparing to become service station attendants.

2355. BRADFORD, ROBERT. *Terminal Program in Woodworking.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 101 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To plan a program of woodwork that might be recommended at Grambling College for terminal students.

Source of Data: Data were secured by an analysis of school records, personal interviews, and check sheets. The Kuder Preference Record, the Otis Self-Administering Test of Mental Ability, and the Progressive Achievement Test Advanced Battery were used for obtaining aptitudes and interests of woodworking students.

Findings and Conclusions: Very few of the 81 students showed interest in mechanical pursuits. Two possessed intelligence quotients over 100 on the Otis Self-Administering Test. Grade placements were low. Forty-one students selected carpentry and 30 selected cabinet making. There were 67 job openings for people trained in this area.

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2356. BROADHURST, JOHN CHRISTIAN. *A Differential Prediction of Success in Vocational-Technical and Vocational-Industrial Courses in A Vocational High School.* Ph.D., 1949, New York University. 112 p. New York University Library, New York, and Library of Congress.

Purpose: To provide by comparing age, 5 test series, and past grades in 6 courses with later school achievement, an objective basis for predicting success in vocational-industrial and vocational-technical courses in the Vocational and Technical High School, Bayonne, N. J.

Source of Data: Student age, scores in 5 tests, and past grades in 5 common tenth-year subjects were correlated individually and in combination with weighted averages of achievement in the eleventh-year school work to determine the best combination of independent variables for predictive purposes. One hundred and forty-five and 69 vocational-industrial and vocational-technical students were involved.

Findings and Conclusions: Past grades in common subjects (and especially physics, shop and drafting grades) were superior predictive instruments for both types of courses, although in varying degree. The best test for predictive purposes was the Purdue Test of Technical Information in Industrial Mathematics. Recommendations were made for lowering slightly the original criteria for admission to vocational-technical courses.

2357. BROCK WILLIAM A. (Masters). *Study to Determine the Significance of Scores Made in Selected Mechanical Aptitude Tests in Connection with Admission to the State Trade School of Lancaster, Pennsylvania,* University of Pennsylvania, c. 1935–47.

2358. BROOKS, VICTOR D. (M. Ed.) *The Correlates and Indices to Success of Fuel Oil Drivers and Operators.* Temple University, 1940. 64 p.

A study of the relation between intelligence and mechanical aptitude test series, education and training, and success in the field. A job analysis of fuel oil driving and criteria of successful driving is included.

2359. BRUNS, LAWRENCE B. *Relation of Scores made on the General Aptitude Test Battery and the American Council on Education Psychological Examination to Academic Grades.* M. S., 1954, North Texas State College. 64 p. Library, North Texas State College, Denton.

Purpose: To find the correlation between scores made on aptitudes "V" and "N" of the General Aptitude Test Battery and Parts "Q" and "L" of the American Council on Education Psychological Examination and academic grades made by students majoring in industrial arts at North Texas State College.

Source of Data: Data were obtained from permanent records of the students.

Findings and Conclusions: A high correlation was found to exist between aptitudes "V" and "N" of the General Aptitude Test Battery and parts "Q" and "L" of the American Council of Education Psychological Examination. Correlation between scores made on the various parts of the two tests and the academic grades made by the students was low.

2360. BURDETTE, WALTER ELBERT, Jr. *Norms for the Occupation of Industrial Arts Teachers in Conjunction With the Kuder Preference Record.* M. S. in Ind. Ed., Kansas State Teachers College, 1948. 50 p.

A comparison of industrial arts teacher interest with that of lay adults as measured by the Kuder Preference Record. The teachers of the sample seemed to be successful in their occupation. Industrial arts teachers' interest norms were established and are held to be valid.

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2361. CASSIDY, EDWARD A. *A Method for Developing a Written Test to Measure Essential Elements in Trade Ability.* Ph. D., 1952, University of

Pittsburgh. 87 p. Library, University of Pittsburgh, Pittsburgh.

Purpose: To develop a method that will identify essential elements in trade ability from which valid factors for a written test intended to measure trade ability can be produced.

Source of Data: Data were obtained from research documents prepared by industrial concerns, trade associations, and research organizations devoted to trade work, text books, training documents from plant and vocational schools, trade magazines, and literature prepared for journeyman use in the trade.

Findings and Conclusions: An inventory of master trade operations that are essential in journeyman work experience was developed. The basic structural units in the machine shop trade were ascertained to be: lathe, milling machine, grinding machine, boring machine, drilling machine, shaper, and planer. To these were added general bench work units of fitting, assembly, erecting, layout, heat treatment, inspection, and toolmaking. The pattern of equipment units in vocational school installations was identified. The relationships between the essential elements in trade ability were established.

2362. CAVE, WALTER O. *A Partial Analysis of the Mechanical Interests and Abilities and the Curricular and Vocational Choices of Lincoln High School Boys.* M. S., 1953, Stout State College. 32 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain whether industrial arts courses in Lincoln High School, Milwaukee, Wisconsin, were enrolling boys with the greatest interest and ability in industrial subjects.

Source of Data: Data were gathered through a test given to male students of Lincoln High School, and by interview of a selected group identified on the basis of test results.

Findings and Conclusions: Lincoln High School boys were only slightly lower than typical boys in ability. Approximately one-half of the boys with both ability and interest in mechanical work planned on earning a major in industrial arts.

2363. CLARK, CALVIN KENT. *Relationship of Scores on Various Psychological Tests to Academic Success in High School.* M. Ed., 1954, North Carolina State College. 33 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the relationship between psychological test scores and academic grades of high school students.

Source of Data: Test data and grades were secured for students, selected at random, from George Washington High School, Danville, Virginia. Correlations were computed between each of the tests and success in school as indicated by the students' scholastic averages.

Findings and Conclusions: Tests used in this study have a higher predictive value for girls than for boys. Various combinations of tests show significant correlations with scholastic averages and would be useful for guidance purposes in the high school.

2364. CLARK, HERMON B. (Masters). *A Study of Mechanical Aptitude Tests in a Trade School.* Massachusetts State College, 1939.

2365. CONNER, DEAN WETHERBEE (M. S.). *A Trade Test in Printing.* University of Pittsburgh, 1935. 54 p.

The development of a trade test in printing based on textbooks, an analysis of the printing trade, and the recommendations of a group of printing teachers interested in a trade test on printing. An attempt at standardization was made by administering the test to 130 tradesmen.

2366. COOVER, SHRIVER L. (M. A.). *A study in the Practice Curves in Learning the Fundamental Processes in the Industrial Arts.* University of Pittsburgh, 1930. 92 p.

The mechanical products of 140 students were measured at six intervals covering a two year period. Thirty-five diagrams are used to show graphically the practice curves for these processes and the relationship that exists among them.

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2367. COOVER, SHRIVER L. (Ed. D.). *The Nature and Measurement of Certain Mechanical Abilities.* University of Pittsburgh, 1941.

An experiment to obtain a valid measure of mechanical ability at the adult level in order to obtain better selection criteria for industrial arts teacher education curricula. A testing instrument in mechanical ability is included.

2368. COSBY, CLIFFORD WAYNE. *Weighting of Characteristics of High School Graduates For Determining Probability of Entrance to College.*

M. S., 1950, Iowa State College. 26 p. Library, Iowa State College, Ames.

Purpose: To derive a prediction formula for students who would enter college.

Source of Data: Data were obtained from the records of 345 students, 62 who entered college, 283 who did not. Biserial technique was used with the discriminant function.

Findings and Conclusions: Three variables were highly significant in the relationship with the dicotomy. A multiple biserial of .5086 was found by using the IQ, high school grade average, and economic status. When IQ was dropped a non-significant loss was reported.

2369. COVINGTON, EDWARD DANIEL (M. S.). *A Standard Industrial Arts Examination in Woodwork.* University of Tennessee, 1937. Published: E. D. Covington, 1936. 84 p.

The compilation of objective means of measuring knowledge of woodworking, with special consideration given to objectivity and ease of scoring. The tests may be used to cover first year work in junior high school, senior high school, or college.

2370. CRAMLET, ROSS C. (Masters). *A Comparison of Junior and Senior High School Students Based on Results of Intelligence Tests, Mechanical Aptitude Tests, Fundamental Tests in Woodwork and Mechanical Drawing.* Iowa State College, 1932.

2371. CRANE, HENRY LUDLOW. *Forecasting at the Ninth Grade Level Future Formal Education and Type of Vocation.* M. S., 1952, Iowa State College. 44 p. Library, Iowa State College, Ames.

Purpose: To forecast the amount of later formal education, and type of occupation.

Source of Data: Data were secured from the records at McKinley Junior High School, Cedar Rapids, Iowa. Quadriserial correlation technique was used. Variables used were IQ, ninth-grade entrance age, and eighth grade mark average.

Findings and Conclusions: Entrance age could be dropped without significant loss for both of the prediction purposes. Correlation between tendency to continue formal education and IQ, with eighth grade average was .6092. The same variables correlated .5678 with tendency to enter white collar occupations.

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2372. CRAWFORD, JOHN EDMUND (Ed. D.). *Measurement of Some Factors upon Which is Based Achievement in Elementary Machine Detail Drafting.* University of Pittsburgh, 1941. 113 p.

An attempt to set up a battery of aptitude tests which will discriminate aptitude for machine detail and design.

2373. CROCKETT, HARRY LINTON (M. S.). *A Series of Manipulative Tests in Hand Composition.* Colorado Agricultural & Mechanical College, 1930. 72 p.

An analysis of the elements necessary for accurate speed in printing by students of high school and trade classes. Eight tests giving instruction and drill and serving as a yardstick for measuring ability are included.

2374. CROSS, HAMILTON (M. Ed.). *Objective Type Tests for the Electric Unit in the Industrial Arts Laboratory.* Colorado Agricultural & Mechanical College, 1947. 86 p.

A test covering essential topics of information for the electric unit in the industrial arts laboratory of the Chicago public schools.

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2375. CRUMPTON, CHARLES R. *A Comparison of Day-Trade with Non Day-Trade Male Students in the Lafayette High School.* Ed. D., 1952, Indiana University. 137 p. Library, Indiana University, Bloomington.*

Purpose: To discover whether significant differences exist between male day-trade school students and other male students of the Lafayette High School, Fayette County, Kentucky.

Source of Data: Data were secured from the following tests: General Aptitude Test Battery, Differential Aptitude Tests, O'Rurke Mechanical Aptitude Test, and the Bell Adjustment Inventory and Questionnaire.

Findings and Conclusions: No significant difference exists between the day-trade and the non day-trade students in spatial aptitude, form perception, aiming or eye-hand coordination, finger dexterity, manual dexterity, space relations, mechanical reasoning, and clerical speed and accuracy.

2376. CURDE, TED WILLIAM. *Predicting Achievement in the Trade and Industrial Orientation Course at Des Moines Technical High School.* M. S., 1951, Iowa State College. 29 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effectiveness of certain factors in the prediction of achievement of students in an orientation course in Des Moines Technical High School.

Source of Data: Data were obtained from the records for 99 students who completed the orientation course during 1949–1950. Linear regression technique was used.

Findings and Conclusions: The only significant factor useful in the prediction was the score on the Revised Minnesota Paper Form Board Test. Other variables made no significant gain in the effectiveness of the prediction.

2377. DANKO, THOMAS J. (M. A.). *An Introduction to "Power Tests" in Electricity.* University of Pittsburgh, 1936. 43 p.

An attempt to construct a number of "power tests." The tests are evaluated as to validity and reliability. The tests are diagnostic and remedial in nature.

2378. DAVIS, WALLACE EARL. *Predicting Degree of Achievement in Industrial Subjects by the Use of Stenquist Mechanical Aptitude Tests.* M. S., North Texas State College, 1940. 37 p.

A study of the application of standardized mechanical aptitude tests in selecting students for shop classes in vocational and technical high schools.

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2379. DEAN, C. THOMAS. *Prediction of Achievement of Native Students in Engineering at Iowa State College.* Ph. D., 1951, Iowa State College. 100 p. Library, Iowa State College, Ames.

Purpose: To ascertain the significant factors that affect college success in the Engineering Division of Iowa State College, Ames, Iowa, and to develop a table of probable success in this curriculum.

Source of Data: Data were obtained from the Registrar's Office, the Testing Service, and the Division of Engineering files for the 833 cases used.

Findings and Conclusions: Prediction of success could be best made by ACE plus high school grade point, or if available, the first quarter marks or mathematics and chemistry sequence marks. Thirty-one per cent of the entering native students graduated.

2380. DECKER, GEORGE C. (Masters). *A Testing Program in Junior-Senior High School Industrial Arts as an Aid to Guidance.* Ohio State University, 1933.

2381. DE FOREST, FRANK RAY. *A Comprehensive New Type Test For Vocational Schools Giving Auto Mechanics Work.* M. Ed., University of Cincinnati, 1937. 135 p.

A test of the objective type for use with advanced students in vocational auto-mechanics courses.

2382. DIXON, CLARENCE RAYMOND (M. S.). *A Testing Program for the Selection and Placement of the Shop Personnel of the Allen-Wales Company.* Cornell University, 1941. 48 p.

A report of a test on general intelligence, mechanical aptitude, and finger dexterity to be used for employing personnel.

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2383. DODGE, ARTHUR FARWELL (Ph. D.). *Occupational Ability Patterns.* Columbia University, 1935. 97 p.

An historical study of vocational testing with emphasis on vocational abilities testing. It considers the mechanical use of vocational tests and the norms which should be used in developing occupational abilities patterns.

2384. DOTSETH, JAMES H. (Masters). *Validation of Instructional Units in Machine Shop from 13 Courses of Study.* Wayne University, 1942.

2385. DUNHAM, VERNON VALRENO. *Achievement Test for First Year General Shop.* M. S., 1952, Kansas State Teachers College. 143 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To compile a series of objective examinations suitable for administration to first year general shop students.

Source of Data: Data were obtained from text and reference books and from publications dealing with objective examinations.

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Findings and Conclusions: Several tests were developed in the areas of general drafting, general woodwork, general metalwork, general crafts, general electricity, and home mechanics.

2386. ELLIS, GERALD EDWIN. *Engineering Drawing as a Predictive Factor for Success in Engineering Studies.* M. S., 1954, Oregon State College. 75 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the value of marks earned in engineering drawing in predicting success in engineering.

Source of Data: Data were secured from official student records and instructors' grade reports.

Findings and Conclusions: The higher a student's grades in engineering drawing the greater his chances of completing his four years work in engineering. Engineering drawing grades, when correlated with specialized engineering grades, show a "substantial" correlation upon which levels of student attainment in engineering studies might be predicted.

2387. ENGELBRECHT, ROGER EVAN. *Usefulness of the Kuder Preference Record for Predicting Achievement in Woodworking at the Iowa State College.* M. S., 1950, Iowa State College. 61 p. Library, Iowa State College, Ames.

Purpose: To study the usefulness of several variables for predicting achievement in two courses in woodworking in the curriculum of Industrial Education at the Iowa State College.

Source of Data: Instructor's grade books, Industrial Education Office records, and the Registrar's records provided checks for data. The prediction of achievement in the two courses included 131 industrial education students during 1947–1950.

Findings and Conclusions: With final grades in the courses as the criterion, the Kuder Preference Record, ACE Score, High School Average, Minnesota Paper Form Board Test, and Owens-Bennett Test of Mechanical Comprehension have no value for predicting achievement in Woodworking.

2388. ERICKSON, ALVIN G. *What Relationship Exists Between the Entrance Examination Scores and Student Achievement in the Trade and Industrial Program at the Trinidad State Junior College.* M. Ed., 1955, Colorado Agricultural and Mechanical College. 46 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the degree of relationship between entrance examination scores and student achievement in the trade and industrial program at the Trinidad State Junior College.

Source of Data: Data were obtained from student records on file in the Office of Admissions and Records, Trinidad State Junior College, Trinidad, Colorado.

Findings and Conclusions: The total arithmetic score taken from the California Progressive Achievement test was by far the best single factor for predicting student achievement in trade and industrial education in the following areas: radio electronics, building trades, and auto mechanics. The better a trade and industrial student's background in arithmetic, the better are his chances of success in the skilled trades courses.

2389. ERICSON, EMANUEL E. (M. S.). *Standards of Attainment in Junior High School Woodwork.* University of Southern California, 1933. 129 p.

A study of methods of setting up standards of attainment in junior high school woodworking shops, giving results of statistical studies of attainment which teachers can measure in students.

2390. ETZEL, SAMUEL (M. S.). *An Analysis of Test Scores in the Ninth Grade, Using the Thorndike-McCall Reading Test, the Otis Test, Stenquist Test (Form II) and Fundamental Shop Tests.* Iowa State College, 1936. 85 p.

A study to determine what scores are made on shop tests by good and poor readers and to discover if reading and intelligence are related.

2391. EVANS, ARTHUR C. *A Study to Determine the Relation of Mechanical Aptitude and Academic Grades of 175 Students Enrolled in North Texas State College.* M. S., 1949, North Texas State College, 50 p. North Texas State College, Denton.

Purpose: To determine the relation of mechanical aptitude and academic grades of students who have completed a minimum of sixty semester hours of college credit and who were enrolled in the major departments of North Texas State College.

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Source of Data: Data for this study were obtained from the MacQuarrie Mechanical Ability Test, the Bennett Mechanical Comprehension Test, and the permanent records of the students as filed in the Registrar's Office of North Texas State College. Other data were obtained from professional magazines, books, and pamphlets.

Findings and Conclusions: In this study the highest score made on the mechanical ability test was 102, whereas a score of 85 is considered very high for the average adult. The lowest score made on this test was 32 which falls in approximately the fourth percentile of the national norms. The resulting range was very large. No relationship was found between the mechanical aptitude and academic grades of the students tested in this study. There was no relation between a student's aptitude in his major field and his mechanical aptitude.

2392. **EVANS, RUPERT NELSON.** *A Suggested Use of Sequential Analysis in Performance Acceptance Testing.* 31 p. College of Education, University of Illinois, Urbana.

Purpose: To ascertain a method for decreasing the cost of performance testing. This study was supported by the Bureau of Naval Personel under Contract N 6ori–07142.

Source of Data: Data were obtained by using statistical techniques developed by Wald and Wolfowitz for industrial quality control and by performance testing of students in Navy schools for electronics technicians.

Findings and Conclusions: A technique is presented which will save half or more of the time usually required for performance acceptance testing whenever testing time per item is high in relation to the time required to score each item, and there is need for testing more than about one hundred persons on the same test, either in one group or in a series of groups. The procedure suggested involves testing a person on one item and then determining whether he should be accepted, rejected, or whether testing should continue. Its use will require few test items for extremely poor persons. For those persons who are mediocre, more test items are required. The results of the abbreviated test correlate about .90 to .95 with a full length test.

2393. **EVANS, RUPERT N.,** *and* **SMITH, LYMAN J.** *A Study of Performance Measures of Trouble Shooting Ability on Electronic Equipment.* 165 p. Personnel Analysis Division, Bureau of Naval Personnel, Washington 25, D. C.

Purpose: To develop tests and methods of testing trouble shooting of electronic equipment. This study was supported by the Bureau of Naval Personnel, under Contract N6ori–07142.

Source of Data: Data were obtained by performance testing of college students and students in Navy schools for electronics technicians.

Findings and Conclusions: Sample tests and test directions are included. The "tab test" method of evaluating problem solving through group testing was improved. This technique appears to have immediate application in electricity and auto mechanics classes. Methods of obtaining high interobserver reliabilities in performance testing are described.

2394. **FALIK, DAVID M.** *Problems in the Construction of Achievement and Performance Examinations for Classroom Use in Industrial Education.* M. Ed., 1953, Wayne University. 32 p. Industrial Education Department, Wayne University, Detroit, Mich.

Purpose: To analyze the basic factors governing the construction, interpretation and usage of objective type achievement and performance tests for use in the field of industrial education.

Source of Data: Data were obtained from literature on the subject.

Findings and Conclusions: Classroom teachers should construct objective tests to increase both achievement and performance in specific areas of industrial education.

2395. **FELBARTH, WAYNE.** *The Pre-Engineering Inventory As A Predictor of Success in Engineering Drawing at the University of Detroit.* M. Ed., 1954, Wayne University. 105 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the average scores of freshman engineering students on the Pre-Engineering Inventory and to correlate these with the student's mean grades for three terms of Engineering Drawing in order to ascertain the validity of this test on the college level and to organize the date in Expectancy Tables by which it is possible to predict an individual's success in Engineering Drawing in terms of his results on the sub-tests of the Pre-Engineering Inventory.

Source of Data: Statistical data were taken from the personal records of students from the Records Office.

Findings and Conclusions: It seems quite evident that an active program of research is needed to develop new instruments and measuring devices for exploring such factors as initiative, industriousness, and imagination. The Pre-Engineering Inventory is an excellent instrument to use as a predictor of success in Engineering Colleges as substantiated by the data.

2396. FIELDS, LAWRENCE B. (M. S.). *A Study of the Results of Exploratory Courses as Given In a Secondary School System.* A & M College of Texas, 1933. 47 p.

Presents in table form, with explanations, measured results of exploratory industrial arts courses in junior high school in Houston, Texas, over a period of years prior to 1933.

2397. FISHER, PRENTICE E. *The Achievement in Trade and Industrial Courses of Farm and City Students.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 60 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To compare the academic achievement of farm and non-farm students in trade and industrial education.

Source of Data: Data were obtained from high school records.

Findings and Conclusions: There is a definite relationship between residence and academic achievement in trade and industrial classes. Out-of-school experiences could be the reason for this difference.

2398. FITZGERALD, BERTRAM LLOYD (M. S.). *Comparisons of Students Who Takes Different Shop Courses.* University of Southern California, 1935. 71 p.

A statistical study comparing various factors in students of different shop groups and determining correlation of various factors of aptitude, intelligence, and grades. The study is based on shop classes in San Pedro High School, California.

2399. FLEITZ, BERT J. *A Comparison of the Effectiveness of Two Courses of Study in Seventh Grade Mechanical Drawing.* M. S., 1953, Bowling Green State University. 47 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To compare the effectiveness of two courses of study in seventh grade mechanical drawing.

Source of Data: Data were secured by an experiment using six classes of seventh grade pupils who had had no previous formal instruction in mechanical drawing. Three of the classes served as the experimental group and three classes as the control group.

Findings and Conclusions: There was a significant correlation, at the 5 per cent level of confidence, between the I. Q.'s as measured by the Terman-McNemar Form C test of mental maturity and the test scores of the pupils in both groups. The experiment indicates that the new type course of study may be superior to the traditional.

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2400. FLEMING, JOSEPH WILLERTON (Ed. D.). *Predicting Trade School Success.* University of Pittsburgh, 1937. 228 p.

A study of school and placement records of boys formerly enrolled in the C. B. Connelley Trade School, Pittsburgh, Pennsylvania, to determine what factors have prognostic value for selecting applicants to this school.

2401. FOSTER, ISAAC RUSSELL (M. S.). *A Test For the Lay of the California Job Case.* Louisiana State University, 1939. 125 p.

A study describing the preparation, tryout, and validation of a test for printing.

2402. FOSTER, JOHN G. (Masters). *A Test for the Lay of the California Job Case.* Louisiana State University, 1939.

2403. FOWLER, RUSSELL WINSLOW (M. S.). *Construction and Use of a Test to Measure Achievement in the Purdue Foundry.* Purdue University, 1930. Published: Lafayette Printing Co., Lafayette, Indiana. 30 p.

The preparation and validation of three objective tests for the measurement of achievement in college foundry practice. The study includes a correlation of the standardized objective test grades with class final grades.

2404. FRIBOURGH, GUNDER FREDERICK. *Predicting Achievement in Machine Shop, Printing, Auto-Diesel, and Aviation Engine Courses at Des Moines Technical High School.*

M. S., 1952, Iowa State College. 54 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effectiveness of certain factors in the prediction of achievement in selected core areas in Des Moines Technical High School.

Source of Data: Data were secured from the Des Moines Technical High School. The regression technique was used.

Findings and Conclusions: The multiple correlations of achievement in a core area and the variables were as follows: machine shop with orientation class marks, .3181; printing shop with revised Minnesota Paper Form Board and orientation class marks, .6249; aviation shop with Bennett Test of Mechnical Comprehension and A. C. E., .4347; auto diesel and orientation class marks, .3766.

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2405. FUZAK, JOHN ALEXANDER (Ed. D.). *Evaluation of Cooperative Attitudes in Industrial Arts Classes.* University of Illinois, 1948. 115 p.

An experimental study to develop a test for measuring the results of efforts to develop cooperativeness in industrial arts classes.

2406. GARRESTON, W. C. (M. S.). *Personal Traits, Knowledge ,and Skills Considered in Reference to Employment in Terre Haute Industries.* Indiana State Teachers College, 1932. 112 p.

A study of sixty major industries in Terre Haute, Indiana, to determine the traits, education, and skills which form the composite of the ideal employee.

2407. GARRISON, PAUL (M. S.). *Relation of High School Mechnical Drawing Grades to Achievement in* Engineering Drawing at Iowa State College, 1948. 36 p.

A study of the value of high school mechanical drawing in predicting the degree of performance in college engineering drawing.

2408. GERBER, HENRY P. (M. S.). *The Construction and Validation of a Performance Test in Orthographic Projection.* Iowa State College, 1935. 89 p.

A test devised to determine the content needed in a mechanical drawing class. The test consists of eighty-one problems and is suited to junior and senior high school students.

2409. GERKEY, DONALD B. *The Preparation and Partial Validation of a Series of Objective Tests for Use in a Course in General Metal Work for High Schools.* M. A., University of Michigan, 1937. 56 p.

Preparation and validation of objective tests to be used in general metal work for high schools.

2410. GIBBONS, WILLIAM (M. S.). *Do the Measurements of the Roosevelt Junior High School Adequately Predict Vocational Achievement in the Altoona Senior High School.* Pennsylvania State College, 1946. 58 p.

A number of students in a junior high school were tested for intelligence, interests, aptitudes, etc., for selective purposes. The progress of these students was checked throughout the sophomore year to determine whether the testing and evaluating program was serving the purpose of vocational selection.

2411. GILLESPIE, POLLARD (M. A.). *Comparative Study of Mechanical Ability of Rural and City Boys.* George Peabody College, 1933. 50 p.

An analysis of the mechanical ability of rural and city boys based on tests given to boys between fourteen and fifteen years of age from rural and city schools in Tennessee. Stenquist Tests Series I and II and Minnesota Mechanical Ability Tests were used.

2412. GOODMAN, JARRETT W. *Effectiveness of Solid Geometry as a Prerequisite for Engineering Drawing.* M. S., 1951, Iowa State College. 26 p. Library, Iowa State College, Ames.

Purpose: To ascertain the usefulness of high school solid geometry in the prediction of achievement in an introductory engineering drawing course.

Source of Data: Data were obtained from the Registrar's Office and Division of Engineering files at Iowa State College. Covariance technique was used in the analysis.

Findings and Conclusions: Students who had received credit for solid geometry in high school made higher marks on engineering drawing than those who had not taken this course. However, there was no difference on the written examination.

2413. GOODRICH, JOHN RICHARD. *The Prediction of Mechanical Ability in Ninth Grade Boys by Means of a*

Block Assembly. M. Ed., University of Cincinnati, 1935. 76 p.

A study of the use of the wiggly block test of mechanical ability as a predictor of success among ninth grade boys in an industrial arts shop in a high school.

2414. GOPPERT, HAROLD RINEHART (M. S.). *Construction and Preliminary Standardization of a Progress Test in Electricity.* Purdue University, 1940. 22 p.

A 150 item progress test in electricity, with a reliability of .95, was developed and administered to 414 high school electricity students. Students were classified according to the total number of class-hours spent in the study of electricity.

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2415. GRANEY, MAURICE R. (Ph. D.). *The Construction and Standardization of the Purdue Mechanical Assembly Tests.* Purdue University, 1942. 81 p.

Nine original mechanical assembly units were developed for the measurement of aptitude. The test was administered to 338 people in five different groups in an effort to obtain positive correlation with merit, rating, grades, and instructor ratings.

2416. GRAY, NOEL OREN. *Relationship of Scores Made on Aptitudes "G" and "V" and Parts "H" and "I" of the General Aptitude Test Battery and Academic Grades Made In Industrial Arts.* M. S., 1952, North Texas State College. 88 p. Library, North Texas State College, Denton.

Purpose: To ascertain the relation of scores made on parts of the General Aptitude Test Battery and academic grades made in industrial arts courses at North Texas State College, Denton, Texas.

Source of Data: Data were obtained from the General Aptitude Test Battery administered to 148 students and from the permanent records of the same students.

Findings and Conclusions: No significant relationship was found to exist between aptitude scores and the academic grades at the .01 and .05 levels.

2417. GRIGG, LESLIE R. *Forecasting High School Graduation at the Ninth Grade Level in the McKinley High School at Cedar Rapids.* M. S., 1951, Iowa State College. 35 p. Library, Iowa State College, Ames.

Purpose: To ascertain pupil characteristics available from school records that could be used in a prediction of high school graduation.

Source of Data: Data were compiled from the records of high school students in Cedar Rapids, Iowa. Of the 248 cases studied, 178 had graduated and 70 had not.

Findings and Conclusions: The variables, age of entrance into ninth grade and eighth grade average, had a correlation of .5912 with the criterion. The variable, IQ, when dropped, produced a non-significant loss.

2418. GUSTAFSON, JOHN L. (Masters). *A Study of Criteria for Selecting Printing Students.* Wittenberg College, 1935.

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2419. HANKIN, EDWARD K. (Ed. D.). *A Study of the Relationships Between the Characteristics and the Educational Attainments of Pupils in Three Mechanical Curriculums.* University of Pennsylvania, 1947. 114 p.

The records of 638 pupils were studied in an effort to improve the selection of pupils for vocational schools. It includes a description of an experimental technique developed for making comparisons.

2420. HANSSON, ANDREW E. *A Comparison of the Vocational Interests of Two Groups of Students in Comstock Park High School, Comstock Park, Michigan.* M. A., University of Michigan, 1948. 40 p.

A study to determine if interests as shown on the Kuder Preference Record given in the ninth grade would tend to remain the same in the eleventh grade. Data were gathered in school year 1946-47.

2421. HARDIN, ROBERT (Masters). *Prediction of School Success in Woodwork.* University of Nebraska, 1931.

2422. HARGER, ROBERT D. *Prediction of the Tendency of Fort Dodge Junior High School Students to Matriculate in College.* M. S., 1952, Iowa State College. 27 p. Library, Iowa State College. Ames.

Purpose: To develop a predictive instrument to assist counselors at Fort Dodge Junior High School to counsel students concerning their matriculation in college.

Source of Data: Data were collected from the Fort Dodge High School records, telephone conversations, questionnaires, and personal interviews. The prediction variables were Otis intelligence quotient and ninth grade average. Triserial correlation and discriminant function techniques were used.

Findings and Conclusions: Triserial correlation of intelligence quotient and tendency to continue education was .3157. The correlation of continuation and ninth grade achievement was .422. The discriminant function has a multiple triserial correlation of .4513 with tendency to continue education. This value is highly significant for prediction.

2423. HASTY, FREDERICK. *An Analysis of Factors Predictive of Mechanical Abilities at the Senior High School Level.* M. A., 1949, Claremont Graduate School. 89 p. Library, Claremont Graduate School, Claremont, Calif.

Purpose: A study concerned with the measurement of the mechanical aptitude of boys in the Junior High School to see how this measure can be related to the guidance program.

Source of Data: The following tests were given to the seventh and eighth grade boys at Fontana Junior High School: California test of Mental Maturity, Stenquist test of mechanical aptitude numbers 1 and 2, an author-constructed mechanical judgment test, a mechanical performance test, parts of the Purdue Industrial Classification test, the student's classroom grades in the school shop course.

Findings and Conclusions: Scores obtained by mechanical aptitude tests, I. Q. tests etc., have a fairly reliable basis for guidance when used with the student's average shop grades.

2424. HAUSERMAN, PAUL I. (M. S. in Ed.) *The Interrelation of Mental Ability and Mechanical Aptitude Objectively Measured and the Quality of Shop Work.* Ohio University, 1936. 39 p.

A consideration of the relationship between general intelligence and success in shop courses as determined by comparing intelligence tests with mechanical aptitude tests and with actual classwork. This study covers a period of time just prior to 1936 and deals with the boys in the author's classes in a central Ohio high school.

2425. HERDMAN, RAYMOND W. *Predicting Pupil Mortality Among High School Boys.* M. S., 1949, Iowa State College. 63 p. Library, Iowa State College, Ames.

Purpose: To discover relationship existing between withdrawals and graduates on 7 counts. To develop a prediction formula using variables available shortly after pupils enter high schools.

Source of Data: Statistical method: Using permanent record cards of Wethersfield Township High School, Kewanee, Illinois as a source of data.

Findings and Conclusions: Significant differences were found for entrance age, I. Q., absence, elementary average, high school average, and industrial arts average. A prediction formula was developed using elementary grade average, I. Q., and entrance age. The prediction formulas used in the statistical treatment were developed in a seminar at Iowa State College during the summer quarter of 1949. A report of this seminar is shown in the appendix.

2426. HEROLD, TALITHA S. (Masters). *An Experiment with Industrial Arts in the Elementary School.* Ohio State University, 1945.

2427. HESSE, ALEXANDER N. (M. S. in Ed.). *A Study of the Relationship Between Grades in Mathematics and Electricity Courses in the Brooklyn Technical High School.* Cornell University, 1941. 128 p.

A study to determine whether success in mathematics courses is prognostic of success in electrical courses at the Brooklyn Technical High School.

2428. HIGH, SIDNEY C., Jr. *Relationship of Scores on Various Psychological Tests to Success in an Industrial Arts General Shop Course at the Ninth Grade Level.* M. S., 1949, North Carolina State College. 63 p. Library, North Carolina State College, Raleigh.

Purpose: To determine the relationship of abilities as measured by scores on various psychological tests to success in a particular type of industrial education course, namely, an industrial arts general shop course at the ninth grade level.

Source of Data: A large number of psychological tests were given to a group of pupils enrolled in a ninth grade general shop course in industrial arts. This was followed by computing the correlations between each of these tests and success in the course as indicated by the year's grade. From the correlations, attempts were made to determine which tests measured factors important to success and then giving weights to each test for predicting pupil's success on the course.

Findings and Conclusions: For practical use in an industrial arts general shop, 2 tests, the Otis S. A. Test of Mental Ability and the Minnesota Paper Form Board Test, would form the best combination. Four reasons favoring the use of these 2 tests were advanced: The coefficient of multiple correlation between the 2 tests together and the criterion is 0.454; the relationship of both of the tests to the criterion is definitely significant; both of the tests are reasonable in cost; and both are group tests and can be readily administered to large numbers of pupils. While the predictive value of these 2 tests would not be sufficiently high to justify selection and elimination of pupils on the basis of scores obtained, the fact was pointed out that the information provided by the 2 tests would be of diagnostic value to the teacher, in that it would indicate which pupils might experience difficulty in the course, enabling the teacher to give special attention to these pupils.

2429. HILL, GENEVA V. ***The Vocational Choices of the Ninth Grade Pupils in Gibbons High School and Their Relation to Vocational Interests, Intelligence, and Occupational Opportunities.*** **M. Ed., 1955, University of Cincinnati. 78 p. Library, University of Cincinnati, Cincinnati, Ohio.**

Purpose: To ascertain the relationship between vocational choices on one hand and vocational interest patterns, intelligence levels, and occupational opportunities on the other, for ninth grade students in Gibbons High School, Paris, Texas.

Source of Data: Data were obtained from intelligence tests, interest inventories and a check list of occupational choice.

Findings and Conclusions: There were significant relationships between vocational choices and vocational interest patterns. Approximately 64 per cent chose occupations related to their interest patterns. It was found that slight relationships exists between intelligence and occupational choice. Approximately 70 per cent of the pupils chose vocations beyond their abilities. Results pointed to a need for a guidance program and curriculum changes in the school in which the study was developed.

2430. HILL, IVAN LEROY. ***Predicting Achievement in Descriptive Geometry.*** **M. S., 1950, Iowa State College. 58 p. Library, Iowa State College, Ames.**

Source of Data: The prediction equations for achievement in descriptive geometry were based on the information available for 200 students in the course of the academic year 1948–1949. Selected psychological test scores obtained in 1947–1948 and the course marks for two semesters of technical drawing were used in the statistical analysis.

Findings and Conclusions: Descriptive geometry achievement may be forecast to some degree at the time a student enrolls as a freshman by a prediction scheme based on scores from selected psychological tests. A combination of pre-college measures and marks for two semesters of technical drawing produced a prediction equation with the highest coefficient of correlation.

2431. HILLER, JESSE A. (M. A.). ***A Prognostic Study for the Unit Trade Shop.*** **University of Pittsburgh, 1933.**

A study evaluating certain tests of mechanical and mental ability and comparing the results with previous school grades to determine criteria for selection of vocational students.

2432. HINTON, JESSE M. (Masters). ***A Study of Some Factors Relating to Achievement in High School Industrial Arts.*** **Colorado State Teachers College, 1930.**

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2433. HOLLINSHEAD, MERRILL T. ***The Prediction of Mechanical Ability in Older Mentally Retarded Boys.*** **Ph. D., 1952, New York University. 119 p. Library, New York University, New York.**

Purpose: To ascertain what commercially available tests of mechanical ability, used singly or in combination, will yield the most satisfactory indication or performance of a mechanical nature with older mentally retarded boys.

Source of Data: Eighty-four mentally retarded boys, ages 12 to 16, with Binet IQ's falling between 55 and 79 were asked to make (from a model) without help a woodwork object; to complete the project, common shop tools were used. On the basis of teachers' judgments, the completed objects were rated on a pass-fail basis, and became the criterion of mechanical performance. Against this criterion, scores of the subjects on a variety of tests were equated. Intercorrelations among the variables were computed, and the best possible battery of measures which predicted the criterion was determined.

Findings and Conclusions: Biserial correlations between the criterion and six separate measures of mechanical ability ranged from .38 (Pennsylvania Bi-Manual Assembly) to .70 (Revised Minnesota Paper Form Board). By the use of multiple regression equation techniques, the best combination of measures for the prediction of the criterion resulted in the following; revised Paper Form Board, Stenquist Assembly, C. A., and Binet IQ provided the maximum multiple correlation of .8169. Individual measures of mechanical ability, used singly, and particularly when combined with the predictive strength of other variables, yield substantial predictions of mechanical performance in older mentally retarded boys.

2434. HORNING, ARNOLD OLIVER (M. A.). *The Construction of Achievement Tests for Ninth and Tenth Grade Woodwork.* University of Southern California, 1931. 97 p.

A study dealing with achievement tests in the ninth and tenth grades. Tests were constructed, given to selected students, and evaluated in terms of certain outcomes of woodworking courses.

2435. HUGHES, BERNARD OWEN. *An Inventory of Leathercraft Test Items.* M. A., 1953, University of Minnesota. 83 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide a group of test items for leathercraft instructors that are geared to objectives.

Source of Data: Data were obtained from publications, leather goods supply houses, and outstanding leathercarvers.

Findings and Conclusions: More work needs to be done with specific objective testing.

2436. ISAAC, FRANK R. (M. A.). *A Survey of Investigations Dealing with Relationship between Personality Traits and Academic and Vocational Success.* University of Colorado, 1940. 88 p.

A study of the literature in the field to show the relationships of personality traits and success in various occupations.

2437. JACKSON, LOWELL F. *Instructions in Validation of A Test in Machine Shop.* M. Ed., 1950, Wayne University. 70 p. Library, Wayne University, Detroit.

Purpose: To construct and validate a machine shop test to be used to measure progress of machine shop students, to test machinists, and to test apprentices.

Source of Data: There are two forms of the test with 100 questions on each form. The test was given to 30 machinists, validated by means of the Kelley technique, revised and given to another 30 machinists. The data are presented in the thesis. The test items were selected from an analysis of the machine shop trade. The number of test items in each unit of the test correspond to the greater emphasis placed on that area by the various apprenticeship programs. The Brown-Spearman Formula was used to check the test for reliability.

Findings and Conclusions: The revised machine shop test, forms a and b, appears to be a reliable test useful to check achievements of students and apprentices. It might also be helpful to employment offices and public school personnel departments. It is believed that the procedure of weighing test items according to apprentice assignments and basing the items on an analysis of the trade have resulted in a reliable measuring instrument.

2438. JANNEY, H. F. (Masters). *A Study to Determine the Mechanical Abilities of Boys in the Prevocational Classes in the Shemaker Junior High School.* University of Pennsylvania, c. 1935–47.

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2439. JARVIS, JOHN A. *Student Survival Factors in The Stout Institute.* Ph. D., 1953, University of Minnesota. 236 p. Library, University of Minnesota, Minneapolis.

Purpose: To ascertain the relationship between entrance tests, high school rank, selected high school subjects offered at college entrance, and freshman scholarship; to determine whether the entrance tests, high school rank, and selected subjects will assist in identifying those who will graduate.

Source of Data: Data were taken from official records at the Stout Institute. Statistical techniques used consisted of analysis of variance, "t" test, zero order correlation, multiple correlation, regression equations, and chi square.

Findings and Conclusions: High school rank possessed by those who graduate is significantly higher than those who do not. Prediction of success or failure in the shop subjects appears to be impractical. Prediction of scholastic success or failure for the academic subjects and for total scholarship seems to merit some consideration.

2440. **JOHNSTON, ALBERT E.** (Masters). *A Study of the Reliability of Certain Industrial Arts Tests.* Iowa State College, 1931.

2441. **KACALEK, LAUDIE BENEDICT.** *Effectiveness of Iowa Tests of Educational Development in Predicting High School Achievement.* M. S., 1955, Iowa State College. 36 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effectiveness of intelligence quotients and ninth grade scores on the Iowa tests of Educational Development in predicting high school achievement.

Source of Data: Data were obtained from the files of the Story City High School, Story City, Iowa.

Findings and Conclusions: The composite score on the Iowa Tests of Educational Development correlated .6290 with the criterion, four year mark average. When the intelligence quotient was used in combination with the test scores the correlation was increased to .6326. It was concluded that academic achievement could be predicted from these two variables.

2442. **KALAHAR, KENNETH E.** *Evaluation of Aptitude Tests for Forecasting Achievement in High School Mechanics.* M. S., 1951, Iowa State College. 38 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effectiveness of certain selected tests in predicting final achievement in a course in mechanics.

Source of Data: Data were obtained from the files of the Mason City, Iowa, high school for the 128 cases in the study. Regression, multiple correlation, and covariance techniques were used.

Findings and Conclusions: It was found that the prediction variables all yielded single correlations of the magnitude of .45. The three most effective predictors found were the Bennett Test of Mechanical Comprehension, The Minnesota Paper Form Board, and the Iowa Tests of Educational Development with a r. q. of .5615.

2443. **LANDIS, RUSSELL HENRY** (M. S.). *The Construction and Validation of An Achievement Test In Printing.* Iowa State College, 1934. 148 p.

An achievement test in printing devised to employ some types of questions not generally found in printing tests. The test also seeks to be limited in scope, adapted to actual teaching conditions, and valid and reliable.

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2444. **LAPIDUS, GEORGE.** *A Comparison of Education and Non-Education Students with Respect to Their Choice of Vocational Objectives.* Ph. D., 1955, New York University. 220 p. Library, New York University, New York.

Purpose: To ascertain the nature and significance of differences in various characteristics between college students who select teaching as a vocational goal and those who choose other vocational goals.

Source of Data: The measurements and indices used in the group comparisons were: high school average, Brookly College entrance examination, American Counsel on Education Psychological Examination, College Grade Index, Thrustone Temperament Schedule, Minnesota Personality Scale, Minnesota Teacher Attitude Inventory, Kuder Preference Record-Vocational, Socio-Economic questionnaire. The population of the study consisted of six hundred and fifty graduates. The statistical techniques used were the t-test, differences between percentages and Chi-square test.

Findings and Conclusions: Small and educationally insignificant scholarship and intellectual differences exist among the groups. The education and non-education students reveal distinct interest preferences and vocational objectives. Relatively definite personality differences exist between the groups and the education students show richer potential for teacher-pupil relationships. Socio-economic factors are of lesser significance than the interests and personality of students in determining their selection of vocational objectives.

2445. **LATHROP, IRVIN TUNIS.** *Predicting Success in Beginning High School Printing.* M. S., 1954, Iowa State College. 43 p. Library, Iowa State College, Ames.

Purpose: To develop a method of predicting achievement in a beginning printing course.

Source of Data: Data were obtained from student performance on written tests, speed tests, and projects. Variables used in prediction were: Otis IQ Scores, Minnesota Paper

Form Board Test Scores, Bennett Mechanical Comprehension Test Scores, O'Connor Finger and O'Connor Tweezer Dexterity Test Scores.

Findings and Conclusions: Written test achievement can be predicted from IQ and O'Connor Finger Dexterity Scores. Speed test performance can be predicted by Minnesota Paper Form Board and O'Conor Finger Dexterity Scores, and project achievement can be predicted from a combination of O'Connor Finger and Tweezer Test Scores.

2446. LATHROP, ROBERT LEE. *Predicting Achievement at Des Moines Technical High School in Selected Core Areas.* M. S., 1954, Iowa State College. 55 p. Library, Iowa State College, Ames.

Purpose: To ascertain the value of The American Council on Education Psychological Examination, the Lee-Thorpe Occupational Interest Inventory, and The Minnesota Paper Form Board Score in predicting achievement in the auto-diesel, cabinetmaking, machine shop and printing areas of the Des Moines, Iowa Technical High School.

Source of Data: Data were obtained from the records of the registrar and boys advisor of the Des Moines Technical School.

Findings and Conclusions: The American Council on Education Psychological Examination and the Minnesota Paper Form Board appear to be of some predictive value in certain areas. The two parts of the Lee-Thorpe Occupational Interest Inventory proved to be of little or no value for predicting achievement in the auto-diesel, cabinetmaking, machine shop and printing core areas.

2447. LEFFEL, GEORGE (Masters). *An Achievement Test in Drawing for Measuring Junior High School Graduates.* Ohio State University, 1940.

2448. LIMBURG, HENRY H. *Prediction of Achievement in the Engineering Machine Design Sequence Courses at Iowa State College.* M. S., 1951, Iowa State College. 44 p. Library, Iowa State College, Ames.

Purpose: To ascertain the degree to which achievement in mechanical engineering design courses can be predicted.

Source of Data: Data were obtained from the Mechanical Engineering Department and the Testing Bureau. Multiple regression and correlation techniques were used.

Findings and Conclusions: Variables found to be useful in predicting achievement in mechanical engineering design courses were: first course, engineering drawing and A. C. E. quantitive score, .394; second course, the variables were of no predictive value; third course, engineering drawing, mathematics, and A. C. E., .369; fourth course, high school grade point average and A. C. E., .231.

2449. LINEBACK, HARDIN (Masters). *An Objective Test for Junior High School Woodworking Courses.* Kansas State Teachers College, 1931.

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2450. LINNICK, IDA. *Effect of Instructions and Resulting Vocational Classifications on a Vocational Interest Inventory as Related to Response Patterns of College Women.* Ph. D., 1949, New York University. 150 p. Library, New York University, New York, and Library of Congress.

Purpose: To study effects of the alteration of directions on responses on a vocational interest inventory test.

Source of Data: One hundred twenty female undergraduates were used in an attempt to see if changing the instructions on a test will change results and also change the classification of different individuals.

Findings and Conclusions: Instructions do play a part in the responses elicited. Response patterns tend to influence resulting occupational classifications.

2451. LORIMER, MARGARET WALLACE (M. A.). *The Strong Vocational Interest Blank as an Aid in Vocational Prognosis (Psychology).* Columbia University, 1943. 26 p.

A study of 397 students who had been given vocational guidance and who had taken the Strong Vocational Test not less than two years previously, in an effort to evaluate the Strong Test.

2452. LUSH, CLIFFORD K. (M. A.). *Studies of Manual Ability. The Development and Use of Objective Measures in Industrial Arts to Determine Relationships Between Manual Ability, Effect of Training, Age, Sex and General Intelligence.* University of Minnesota, 1936. 124 p.

The characterization of 800 junior high school pupils, having various industrial arts show experiences, to determine the relationship of their shop experiences (of arm, finger, and wrist dexterity) to their general intelligence. Tests for motor ability related to arm, finger, and wrist were developed, administered, and validated.

2453. MAHANY, ROBERT EUGENE. ***Technique of Selecting Pupils for High School Woodworking.*** **M. S., 1952, Iowa State College. 31 p. Library, Iowa State College, Ames.**

Purpose: To develop a technique for the selection of pupils for a course in beginning woodworking at Ottumwa, Iowa.

Source of Data: Data for the 108 cases studied were collected from the junior high schools in Ottumwa, Iowa. Multiple correlation, regression, and discriminant function techniques were used to handle the data.

Findings and Conclusions: The only significant variable found was 9th grade industrial arts mark with a correlation of .353.

2454. MAHON, ROBERT D. ***Prediction of Achievement in a Radio Course at the American Technical School.*** **M. S., 1952, Iowa State College. 26 p. Library, Iowa State College, Ames.**

Purpose: To ascertain the usefulness of certain factors in predicting achievement in a radio course at the American Technical School.

Source of Data: Data for the 110 cases were obtained from the American Technical School files. Analysis of linear multiple regression technique was used.

Findings and Conclusions: Age could be dropped from the prediction equation without a significant loss. Otis IQ, entrance mathematic score, and number of previous years of education yielded a correlation of .473.

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2455. MALLARY, BENJAMIN ELISHA (Ed. D.). ***The Use of Objective Techniques in the Selection of Trade and Industrial Teachers.*** **University of California at Berkeley, 1932. 207 p.**

A study of the problem of selecting workers from trades to teach vocational subjects in public schools. It indicates the selective criteria used in California.

2456. McCALEB, OMER KENNILWORTH. ***High School Drawing and Certain Other Factors Relating to Student Performance in Engineering Drawing.*** **M. S., 1954, Oregon State College. 39 p. Library, Oregon State College, Corvallis.**

Purpose: To compare the performance of college freshmen in engineering drawing with performances in high school mechanical drawing, high school scholastic rank, ACE psychological exam, and college mathematics placement test.

Source of Data: Data were secured from the records of engineering drawing students at Oregon State College.

Findings and Conclusions: Grade point average for the high-school-drawing group is higher than for the no-high-school-drawing group. Q-score, L-score, and high school deciles are good predictors for the no-high-school-drawing group. College and math placement test scores are good predictors for the high-school-drawing group. Drop-outs from the no-high-school-drawing group exceed those for the high-school-drawing group by 12 per cent.

2457. McILVAIN, TOM. ***A Study of the Various Types of Testing Programs Used by Teachers of Mechanical Drawing in the High Schools of Texas.*** **M. S., 1949, North Texas State College. 73 p. Library, North Texas State College, Denton.**

Purpose: To determine what type of tests are being used in mechanical drawing by the high school teachers of Texas and to suggest ways in which testing in mechanical drawing may be improved.

Source of Data: A questionnaire was sent to 177 high schools in Texas to determine the methods being used in testing mechanical drawing students.

Findings and Conclusions: Of the different types of tests available, the ones most used were: The practical problem, completion, true-false, essay, multiple choice, identification, and matching in the above order. It was indicated that for best teaching results a test should be given every 3 weeks. The test should be returned to the student after it is scored so he may review and correct it. Standardized tests could be used to advantage in helping the teacher to compare his classes, students, and himself.

2458. MISNER, RALPH J. (Masters). ***A Comparison of Traits and Characteristics of High School Seniors Who Chose the Industrial Arts, Commercial and Other Curricula.*** **University of Wisconsin, 1934.**

2459. MORECOCK, EARL M. (Masters). ***An Experimental Test for Predicting the Success of Applicants to the Cooperative Technical Courses at the Rochester Institute of Technology.*** **University of Rochester, 1945.**

2460. MORK, THOR H. *A Testing Program in Elementary Electricity.* M. A., University of Minnesota, 1937. 170 p.

A study of the usefulness of accomplishment tests and of certain types of test construction items, with preparation of more than 650 items in elementary electricity.

2461 MORRIS, ELIZABETH TERESA, (M. A.). *The Correlation of General Intelligence and Ability in Manual Arts.* Washington University, 1931. 85 p.

A study to determine to what extent, if any, teachers are justified in recommending the practical arts course to boys with low I.Q.'s or low academic grades in an effort to guide eighth grade graduates of inferior intelligence and poor scholarship.

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2462. MORTON, BERRY EZELL. *A Comparison of Day-Trade and Non-Vocational High School Seniors.* Ed. D., 1950, University of Missouri. 201 p. Library, University of Missouri; Columbus.

Purpose: To ascertain whether personal-social differences exist between high school seniors enrolled in day-trade classes and those not enrolled in vocational classes, and to ascertain the nature and extent of these differences if existing.

Source of Data: Data were obtained through high school records, information forms, the SRA Test of Primary Mental Abilities, and the Kuder Preference Record for 195 day-trade and a random sampling of the same number (195) of non-vocational students enrolled in 12 Missouri comprehensive high schools having day-trade programs. The two groups were then compared.

Findings and Conclusions: Students enrolled in day-trade classes and non-vocational classes were apparently equal in age and grade placement. Students enrolled in day-trade and non-vocational classes had a wide range of intelligence but the mean intelligence of the students in day-trade classes was below that of the students enrolled in non-vocational classes. Students enrolled in day-trade classes came from families of a lower economic strata, from parents of lower formal educational attainment, from slightly larger families, and from more broken homes than did students enrolled in the non-vocational classes. Students enrolled in day-trade classes and non-vocational classes ranged widely in scholastic achievement, however, the mean scholastic achievement of students in day-trade classes was inferior and also below that of the students enrolled in non-vocational classes. Students enrolled in day-trade and non-vocational classes had wide range of occupational interests, and there were marked differences and similarities in the occupational interests of the two groups. Students enrolled in day-trade and non-vocational classes tended to have different curricular needs and interests. Students enrolled in day-trade classes did not possess leadership qualities to the same extent as did the non-vocational classes when measured in terms of school offices held.

2463. MULVANY, SHERMAN A. (M. S.). *The Reliability of Certain Essay Examinations in Industrial Arts Woodworking.* Iowa State College, 1932. 85 p.

A study of three essay woodworking tests given to ninety-one junior high school pupils to determine the value of essay-type tests as opposed to objective tests.

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2464. NAIR, RALPH KENNETH. *Predictive Value of Standardized Tests and Inventories in Industrial Arts Teacher Education.* Ed. D., 1950, University of Missouri. 147 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the effectiveness of a group of standardized tests and inventories in predicting achievement in certain technical courses of college grade commonly required of industrial arts teachers.

Source of Data: A group of six standardized tests and inventories was administered to 367 industrial arts students at three California colleges. Using as the criterion letter grades assigned by instructors in drafting and shop work, the study utilized two major types of statistical treatment: Correlation and prediction of the relationship between performance on the tests and the criterion; multiple, factors analysis of the test indicating higher degrees of predictive value.

Findings and Conclusions: Drafting and shop grades can be predicted with only a slight degree of reliability when these six tests and inventories are used. The best combination of predictors was found to be the "California Short-Form Test of Mental Maturity" and Bennett's "Test of Mechanical Comprehension." Almost all of the standardized measures used indicated more positive relationship with drafting grades than with grades in shop work. The mental maturity test, in either its language or non-language section, along with the "Detroit Mechanical Aptitudes Examination" and Bennett's "Test of Mechanical Comprehension" had the highest and most consistent mutual factor loadings with drafting and shop grades.

2465. NEEDLER, CLARENCE A. (M. S.). *A Procedure to Ascertain Effect of Age, General Intelligence, and Educational Level on Rate of Acquisition of a Specific Machine Shop Operation.* Colorado Agricultural & Mechanical College, 1934. 89 p.

A procedure to ascertain whether certain factors affect the rate of student acquisition of a specific machine shop operation.

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2466. NELSON, HOWARD FREDERICK. *The Relationship Between a Measure of General Industrial Arts Information and Selected Factors Resident in the Teacher, in the Pupil, and in the School.* Ed. D., 1953, University of Kansas. 203 p. Library, University of Kansas, Lawrence.

Purpose: To gain an estimate of the influence of selected factors about the teacher, pupil, and school on the industrial arts knowledge possessed by senior high school boys from a representative sample of Kansas high schools.

Source of Data: Data were obtained from scores on the Terman-McNemar Test of Mental Ability, the Essential High School Content Battery, and the Nelson Inventory of General Industrial Arts Background for senior high school boys from a representative sample of forty-two. Data concerning the schools and teachers were obtained from public records of the State Department of Education. Data were analyzed by the technique of analysis of variance and covariance.

Findings and Conclusions: Boys scored significantly higher on the inventory when: teachers were in the upper quarter in a distribution of semesters of training; teachers had four units of high school industrial arts; teachers taught only industrial arts classes; teacher received highest salary recorded for one-man departments; teachers had at least three years' experience but not over ten; enrolled in any size school other than one from 50 to 99; students increased their units of industrial arts courses; students had taken both junior and senior high school courses; students had taken any one course or combination of courses rather than none at all; students had work experience plus at least two semesters of course work; and students were enrolled in industrial arts rather than vocational agricultural courses.

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2467. NEWKIRK, LOUIS VEST (Doctors). *Validating and Testing Home Mechanics Content.* University of Iowa, 1929. 41 p.

2468. OAKS, ORVILLE A. (Masters). *Development and Partial Standardization of Objective Reading Tests in Elementary Mechanical Drawing.* Northwestern University, 1931.

2469. OLDKNOW, J. T. *Achievement Tests in Industrial Education.* M. A., University of Minnesota, 1946. 73 p.

A comparative study of 118 achievement tests published in *Industrial Arts and Vocational Education* magazines, 1936 through 1945.

2470. PARTRIDGE, PAUL W. *The Evaluation of Cooperative Attitudes in Industrial Arts Classes.* M. A., 1952, University of Minnesota. 103 p. Department of Industrial Education, University of Minnesota, Minneapolis

Purpose: To identify cooperative behavior characteristics of industrial arts students, to construct a pencil and paper evaluating instrument to measure cooperative attitudes, and to test the reliability and validity of this instrument in an industrial arts classroom.

Source of Data: Data were obtained by analyzing the characteristics of a cooperative person, constructing evaluating instruments, and trying these out with qualified judges.

Findings and Conclusions: It is possible to measure cooperative attitudes in industrial arts classes. Present instruments for evaluation of cooperative attitudes in industrial arts classes need further study and refinement.

2471. PATTERSON, ROBERT J. (Masters). *An Objective Trade Test in Aircraft Engines.* University of Pittsburgh, 1934.

2472. PETERSON, MARTIN WILLIAM. *Developing a Testing Program for Industrial Arts Courses.* M. Ed., 1954, University of Cincinnati. 89 p. Library, University of Cincinnati, Cincinnati, Ohio.

Purpose: To describe the procedure employed in developing tests for an industrial arts course.

Source of Data: Data were obtained from tests used in the industrial arts testing literature, books, and periodicals.

Findings and Conclusions: A series of unit-type tests was developed to aid in the evaluation of student progress and scoring technique was developed to minimize time spent in testing procedures.

2473. PICKENS, VERNE L. (Masters). *The Standardization of a Test in Drafting.* University of Colorado, 1930.

2474. PIERSON, EDWARD MAURICE, (M. S. in Ed). *The Effect of Written Tests on Achievement in Mechanical Drawing.* Cornell University, 1941. 66 p.

A series of test items to be given to mechanical drawing students immediately upon completion of a unit of work. The test items that have been used are included in the thesis along with the course material that the units illustrate.

2475. RAMEY, WALTER SCOTT. *Usefulness of the Lee-Thorpe Occupational Interest Inventory for Predicting Achievement and Choice of Core Areas in Des Moines Technical School.* M. S., 1955, Iowa State College. 89 p. Library, Iowa State College, Ames.

Purpose: To ascertain the value of a ninth grade battery of tests for predicting achievement in and selection of core areas.

Source of Data: Data were obtained from the files of the Des Moines Technical School.

Findings and Conclusions: None of the variables used were of significant value for predicting achievement. When the group was divided into two core area classifications, mechanical and non-mechanical, for purposes of predicting core area selection, it was found that mechanical and natural interest scores from the Lee-Thorpe Interest Inventory would discriminate significantly (.516) between the two groups.

2476. RENESON, MATHEW W. *Aptitude Testing and Industrial Education.* M. A., 1949, University of Minnesota. 89 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To aid industrial education instructors and administrators in better understanding of aptitude testing and test scores.

Source of Data: Each of 10 books reviewed as to contents of chapters dealing with aptitude testing and test sources.

Findings and Conclusions: A table was prepared as to tests recommended or discussed in the 10 books together with a list of aptitude testing terms.

2477. RICHARDS, CARL DICK. *The Evaluation of Certain Factors for Predicting First Year Academic Success of Industrial Arts Students Entering Illinois State Normal University.* M. S., 1948, Illinois State Normal University. 81 p. Library, Illinois State Normal University, Normal.

Purpose: To develop a formula for prediction of freshman academic success from the freshmen battery of tests at Illinois State Normal University, and to discover how accurately that formula would predict success in Industrial Arts.

Source of Data: Data were obtained from the records of the freshmen battery and honor point hours at the Illinois State Normal University.

Findings and Conclusions: Certain of the factors investigated could be identified with overachievement and others with underachievement. It seems necessary that these factors be operative in combinations of two or more. This investigation has provided definite evidence of the existance of extraneous and irrelevant activities which are operative in academic situations.

2478. RITCHIE, LYLE G. (M. A.). *Validating a Machine Shop Test.* Wayne University, 1935. Published: Wayne University, 1935. 95 p.

A statistical study, including the period 1921 to 1935, to ascertain the correlation of machine shop tests in statewide use with reading tests, I. Q. scores, and machine pupil grades.

2479. ROBERTS, LOYAL RAYMOND. *Predicting Achievement in General Metal Shop in Junior High School.* M. S., 1949, Iowa State College. 36 p. Library, Iowa State College, Ames.

Source of Data: Data were collected from 100 boys in 4 eighth grade classes over one semester's work in general metal shop.

Findings and Conclusions: The pretest with a correlation of .777 provided the best single variable prediction. Pretest and I. Q. marks served as the best combination of two variables with a correlation of .791. A co-efficient of correlation of .806 was found when all three variables were used.

2480. **ROGERS, WILLIAM WOLLARD** (M. S. in Ed.). *A Study of the Development of a Mathematics Achievement Test for Use in the Selection of Entrants to the Ninth Year of a Technical and Industrial High School.* Cornell University, 1943. 77 p.

An achievement test in mathematics for selecting entrants to the industrial and technical high school. The four basic mathematical manipulations in whole numbers, fractional numbers, and decimal numbers are tested in the examination. Validation has been partly accomplished, and some improvements in the test are suggested as a result of the experience which the author has had with it during the two years that the test has been used.

2481. **RUTLEDGE, E. M.** (M. Ed.) *How Talents of High School Boys Can be Discovered.* Colorado Agricultural & Mechanical College, 1945. 83 p.

A study of means of discovering the inventive talents of high school boys. Ten characteristics of inventors that may be discovered in students are quoted and suggestions are offered for measuring these characteristics.

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2482. **SALTEN, DAVID GEORGE** (Ph. D.) *The Construction of Achievement Tests for Related Technical Subjects in Vocational High Schools—A New Test in Cosmetology.* New York University, School of Education, 1944.

The development of evaluative instruments for related technical subjects in vocational education. The study considers the use and value of tests, individual test items and their assembly into preliminary test form, and the administering of final tests to selected groups.

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2483. **SANDERSON, HERBERT.** *The Relationship Between Emotional Adjustment and Spatial Visualization Among High School Students.* Ph. D., 1948, New York University. 169 p. Library, New York University, New York and Library of Congress.

Purpose: To determine whether a measurable relationship exists between emotional adjustment and spatial visualization among high school students.

Source of Data: Two hundred high school boys between 15 and 18 years of age were randomly selected. The Otis Self-Administering Test of Mental Ability, the Revised Minnesota Paper Form Board, the Minnesota Spatial Relations Test, the Crawford Spatial Relations Tests, and the P–S Experience Blank were administered. In addition, previous history, observations during several interviews were the basis for detecting emotional maladjustment clinically. The data was statistically analyzed.

Findings and Conclusions: A slight positive relationship exists between spatial test scores and personality test scores. The relationship was not significantly affected by partialling out the intelligence factor. The relationship was not numerically the same for all 3 of the spatial relation tests. The qualitative examination of the clinical data indicates that the relationship may be somewhat greater than indicated by the statistics.

2484. **SAVAGE, WILBUR C.** *The Construction of a College Entrance Examination Capable of Measuring the Mechanical and Related Knowledge Desirable in a Prospective Industrial Arts Student.* M. S., 1950, The Pennsylvania State College. 88 p. Library, Pennsylvania State College, State College.

Purpose: To prevent applicants from entering the college industrial arts curriculum who would probably be unsuccessful teachers.

Source of Data: A test was constructed by selecting a representative number of test items for each area through which industrial arts interest is acquired. The test items were validated by outstanding senior industrial arts students and revised in accordance with their suggestions. The test was then administered in 10 high schools to 52 senior industrial art students who expressed a desire to become industrial arts teachers. The instructors labeled them as either possessing successful or unsuccessful future teaching qualities.

Findings and Conclusions: From the test results, norms were established. Direct relationship exists between the test scores of high school seniors who in the opinion of their industrial arts teacher, possess the qualities of future successful industrial arts teachers. According to the results of the test administered to both groups, industrial arts teachers are fairly accurate in selecting high school seniors under their supervision who would probably become successful industrial arts teachers.

2485. **SCHAHET, HAROLD M.** (Masters). *Industrial Arts as a Selective Agency for Entering Vocational Trades.* Ohio State University, 1946.

2486. **SCHEUHING, MARY A.** (M. Ed.). *An Analysis of the Predictive Efficiency of Certain Test Scores and Grades in the Selection of High School Students for the Industrial Auto and Electric Shop Courses.* Temple University, 1948. 66 p.

A comparison of the results of various aptitude and ability tests as given to the fifty best and the fifty poorest students in electric and industrial auto courses in Overbrook High School, Philadelphia. Recommendations are offered for students not succeeding in industrial courses.

2487. **SCHNEIDER, PERRY L.** (Masters). *The Construction and Validation of an Objective Test in Shopwork as a Prognostic Index of the Student's Ability in Woodworking in Elementary Schools.* City College of New York, 1931.

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2488. **SCHULTZ, IRWIN J.** *Predicting Success in Trades and Grouping of Trades.* Ed. D., 1949, University of Pittsburgh. 171 p. Library, University of Pittsburgh, Pittsburgh, Pa.

Purpose: To determine the relation between intelligence quotients and school marks and success or failure in vocational high school shop subjects.

Source of Data: Analysis and questionnaires.

Findings and Conclusions: The best predictor of success was found to be the marks in English, science and mathematics, combined. The I. Q. was found to have predictive value in showing the importance of persistence. The follow-up of former students at the Connelley Vocational High School (Pittsburgh, Pa.) showed that high marks in vocational shop and related subjects was a good indication of success on the job, and that those who continued until graduation were most likely to receive an "excellent" rating from employers.

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2489. **SCOTT, CHARLES PALMER** (Ed. D.). *Predicting Vocational Industrial Teaching Success.* University of Pittsburgh, 1943. 146 p.

A study of the predictive value of certain factors in the selection of prospective vocational industrial shop teachers, both before entrance into the vocational teacher education program and before entrance into teaching.

2490. **SENES, S. JAMES** (M. S.). *Objective Type Tests for Electrical Conduit Wiring.* Colorado Agricultural & Mechanical College, 1939. 108 p.

From tests on electrical conduit wiring, a list of essential topics of information and improved methods of instruction are developed.

2491. **SMALL, WARREN L.** (M. S.) *The Development of an Objective Test in Metal Fitting.* University of Pittsburgh, 1935. 140 p.

An attempt to obtain a wide sampling of objective test items on the operations and processes which comprise the basic content of a course intended to lay the foundation for the mechanic in any field in which knowledge about and the skillful use of hand tools in metal fitting are important assets.

2492. **SMITH, RICHARD BONSALL.** *The Development of a Performance Test in Senior High School Machine Shop.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 149 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To develop a performance test in senior high school machine shop.

Source of Data: Operations were selected with the cooperation of 20 teachers of machine shops. A test problem involving selected operation was set up and administered by 97 pupils.

Findings and Conclusions: A performance test may be treated statistically much the same as paper and pencil tests as regards validity, item validity and reliability.

2493. **SMITH, VICTOR J.** (Masters). *The Organization of Unit Tests for Industrial Education Classes.* Teachers College, Columbia University, 1930.

2494. **SPALDING, FRED L.** *An Analysis of Objective Type Examinations.* M. S., 1951, Stout State College. 234 p. Library, Stout State College, Menomonie, Wis.

Purpose: To find a means for the improvement of the test as an instrument for predicting an applicant's probable success in graduate work, and to establish a satisfactory and workable procedure for evaluating the results of any objective-type test.

Source of Data: Data were selected from a random sample of tests available. This group of test papers was then used to determine test reliability for the item analysis and to compute the necessary coefficients of correlations. Analysis of Variance was used to compute test reliability and test significance.

Findings and Conclusions: The coefficient of correlation found between total test results and undergraduate grade point averages was .556; for selected test items this coefficient was found to be .608. Test reliability for the several parts of the test ranged from .335 to .713 as determined by the analysis of variance. The study pointed out the test questions to be revised or to be eliminated from the test when it is revised.

2495. STAATZ, MERLIN D. ***Relationships of Grades of 111 Industrial Education Majors to Selected Standard Tests.*** **M. S., 1952, Kansas State Teachers College. 34 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To ascertain the relation of grades earned and standardized test scores for a group of 111 industrial education majors of Kansas State Teachers College of Pittsburg, Kansas, during the period of the fall semester of 1948 through the spring term of 1951.

Source of Data: Data were obtained from a comparison of the grade point averages with the college average, correlation of rankings of total grades and industrial education grades with the American Council on Education Psychological Examination and correlation of the rankings of total grades and industrial education grades with mechanical and artistic interests of the Kuder Preference Record.

Findings and Conclusions: Industrial education grade point average was more than one-half grade point higher than the average of grades received in other subjects. Total grade point average was lower for industrial education majors than that of the College, as a whole, being 1.49 compared to the college average of 1.68. Low co-efficients of correlation were found between grade point rankings and parts of the American Council on Education Psychological Examination. Total grades tended to correlate higher than did industrial education grades.

2496. STAGNER, LEVI E. ***Industrial Arts Testing Programs in the State of Kansas.*** **M. S., 1954, Oklahoma Agricultural and Mechanical College. 82 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To ascertain the status of the industrial arts testing programs in Kansas.

Source of Data: Data were obtained from books and questionnaires.

Findings and Conclusions: The industrial arts teachers of Kansas have a well rounded testing program. Objective tests were used predominately.

2497. STANNARD, CEDRIC (M.A.). ***The Prognostic Value of the MacQuarrie Test for Mechanical Ability.*** **University of Southern California, 1930. 64 p.**

A study of the MacQuarrie test as given to seventy-six boys in several different types of shops, given during the first twenty-week period of school.

2498. STAPLETON, JOHN E. ***1200 Test Items In Industrial Arts.*** **M. A., 1951, University of Minnesota. 121 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To compile a list of standard test items on drawing, electricity, sheet metal, and woodworking.

Source of Data: Data were obtained from magazines published from 1933 to 1950.

Findings and Conclusions: The report contains a compilation of test items for use in five areas of industrial arts.

2499. STEVASON, CARL CLAYTON (M. S.). ***The Construction and Evaluation of an Achievement Test to Cover Unit Trade Machine Shop.*** **Purdue University, 1939. 78 p.**

Trade analyses and courses of study were analyzed in an effort to construct, try out, revise, and finally administer an achievement test. Four hundred and fifty trade machine shop students were tested and statistical measures were computed.

2500. STILES, FRED DELMAR (M. S.). ***A Critical Analysis of Objective Woodworking Test Questions Used by Illinois Industrial Arts Teachers.*** **Iowa State College, 1936. 52 p.**

A survey to analyze critically the objective woodworking tests now in use by Illinois industrial arts teachers. Criteria for checking the questions were obtained from eight textbooks and four magazine articles.

2501. STOCKEY, MERREL R. *Vocational interests of Adolescent Children with Reference to their Measured Personality Characteristics.* **M. A., 1949, University of Michigan. 41 p. Education Library, University of Michigan, Ann Arbor.**

Purpose: To analyze the measured interests of adolescent children with reference to their scores on a standard test of personality.

Source of Data: Previous research treating the problem was examined to provide background material for the present study. Tests were administered to 218 subjects: 118 boys and 100 girls and the data were presented and analyzed separately by sexes. The tests used were: The Occupational Interest-Intermediate Series and the California Test of Personality-Intermediate Series. (Reasons were given for choosing these tests, especially.) In each group the procedure followed was to determine the average California Occupational Interest Inventory profile and the average California Personality Test profile for the entire population.

Findings and Conclusions: Most investigation in the past were based on studies of college students from higher socio-economic levels and no literature was found that considered interest-personality relationships among adolescents from somewhat less favorable backgrounds. Significant conclusions from the present study are: From the boys' study: Interests of this group differ somewhat from those of the population on whom the test was standardized; the former expressing a greater interest in art, and less interest in science; little significance between primary vocational choice and personality adjustment was established; personality scores compared essentially the same with primary interest choices as the interest selections with the 3 personality measures of the test; no adequate differentiation between interests and social adjustments was made. From the girls' study: Average interests and personalities of the sample group, on the other hand, approximated closely those of the original standardized group; with respect to personality and primary interest selection, girls electing the mechanical field were significantly less adequate, in one or more personality measures, than those of every other interest category.

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2502. STOUGHTON, ROBERT W. *The Differential Predictive Values of the Differential Aptitude Tests in the Connecticut Technical Schools.* **Ph. D., 1955, University of Connecticut. 221 p. Library, University of Connecticut, Storrs.***

Purpose: To investigate the extent to which the Differential Aptitude Tests may be useful in the differential prediction and direct prediction of success in Connecticut technical schools.

Source of Data: Data were secured by administering the Differential Aptitude Tests to 729 ninth grade boys in five shop areas in ten Connecticut technical schools, instructors ratings of student ability, tendency of students to persist in school, and mean scores of students in each of the five trade groups who completed the eleventh grade.

Findings and Conclusions: The Verbal Reasoning and Numerical Ability tests tend to have a relatively high relation to success in all general education and most of the shop courses studied. The Clerical Speed and Accuracy and the Language Usage tests yielded the lowest validity coefficients. The Abstract Reasoning, Space Relations, and Mechanical Reasoning tests are more useful for predicting shop success than for predicting general education success. The data suggest that these three tests can be used with caution for differential prediction; that the differences in abilities required for success in the five shops studied are such that the trades should not be grouped as one occupational family; and that there are differences in the relation between abilities as measured by the DAT and success in shop at the grade-nine and grade-eleven levels.

2503. SWANSON, EDGAR P. (M. S.). *Prediction of Achievement in Technical Service Courses at the Iowa State College,* **Iowa State College, 1944. 54 p.**

A study to develop a technique of predicting the final grade average for any trainee graduating from the Naval Electrical School. Five scores were used for each man: general classification, mechanical aptitude, English, mathematics, and spelling.

2504. THEALL, PRESTON JAMES. *A Survey of the Personnel Testing Practices in Manufacturing Companies in the State of Indiana.* **M. S., 1954, Purdue University. 37 p. Industrial Education Office, Purdue University, Lafayette, Ind.**

Purpose: To ascertain the nature and extent of the testing programs conducted by manufacturing companies in Indiana.

Source of Data: Data were obtained by means of questionnaires from 83 manufacturing companies in Indiana.

Findings and Conclusions: Sixty-three per cent of the organizations use personnel tests, mostly standardized tests. The most commonly employed types of tests are clerical aptitude, used by 58 per cent of the companies, and intelligence and mechanical ability, each used by 50 per cent of the companies. Most companies use personnel tests for hiring, for promotion, and for placement.

2505. **THOMPSON, MELVIN VIRL.** *Prediction of Achievement in Advanced Shop Courses in the Senior High School.* M. S., 1950, Iowa State College. 36 p. Library, Iowa State College, Ames.

Purpose: To ascertain the effectiveness of course marks for predicting achievement in advanced shop courses in senior high schools.

Source of Data: Data were obtained from the high school files at Hannibal, Missouri. Analysis of regression and analysis of covariance techniques were used to treat the data.

Findings and Conclusions: The variables correlated singly with the criterion : general shop, .479 ; English, .379 ; mathematics, .325. English and general shop marks with the criterion gave a correlation of .517. Mathematics was dropped without a significant loss.

2506. **THUMLERT, CHARLES E. (M. Ed.).** *The Relation of Pupil Aptitude to Success in Certain Trade Orienting Courses.* Temple University, 1941. 44 p.

An analysis of the pupils entering and remaining in the mechanical construction and automobile mechanics course. Aptitude test scores were correlated with shop achievement test scores.

2507. **TRIMBLE, GREEN B. (M. S.).** *A Study of Student Progress in the Fort Worth Vocational School to Determine a Basis for Entrance.* Colorado Agricultural & Mechnical College, 1934. 191 p.

A study of the effect of age, school success, school attitude, and other factors relating to entrance, upon the probable success or failure of the vocational school student at Fort Worth, Texas.

2508. **URNER, LEWIS H.** *The Development of a Tridimensional Spatial Relations Test to Measure the Drafting Ability of Industrial Arts Students.* M. S. in Ind. Ed., 1949, Kansas State Teachers College. 36 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To develop a test that can be used for testing drafting ability of industrial arts students.

Source of Data: The experimental method was employed using 25 high school seniors. Analysis and interpretation of the data collected were treated statistically.

Findings and Conclusions: Three spatial relationships tests were developed similar to the Crawford Relationship Test. A substantial correlation was found to exist between the tests themselves. Some correlation was found to exist between the tests and shop grades. Fairly high correlation exists between scores made on the tests and drawing grades.

2509. **VAN TASSEL, PAUL A.** *A Prognostic Study in Industrial Arts.* M. A., 1949, University of Michigan. 51 p. Library, University of Michigan, Ann Arbor.

Purpose: To test the validity of the conception that students who do not succeed in academic subjects are likely to succeed in industrial arts.

Source of Data: Teachers' marks in industrial arts, English, mathematics, science, and social studies were gathered from the files of two high schools. Comparison of teachers marks were made by computing Pearson's coefficient of correlation, scattergrams, graphs and probability charts.

Findings and Conclusions: The prevalent attitude which provoked the study seems to be justified by the data. High marks in academic subjects indicate high marks in industrial arts. But those who received low marks in academic subjects most frequently received higher marks in industrial arts. The student's academic average vs. industrial arts marks show a correlation coefficient of .60. This index in not sufficiently close to justify individual prediction of marks. The low correlation of industrial arts and intelligence quotients (.28) indicates that intelligence quotients may not be used to foretell success in industrial arts.

2510. **VAN WINKLE, KEITH MERLE.** *Predicting Achievement in Junior High School Required Industrial Arts.* M. S., 1950, Iowa State College. 57 p. Library, Iowa State College, Ames.

Purpose: To ascertain the value of the following measures in predicting achievement in industrial arts: Otit IQ, Minnesota Paper Form Board Test, general science year mark, Lee-Thorpe Mechanical Interest, Lee-Thorpe Occupational Interest Inventory.

Source of Data: Data were obtained from the guidance files of Ames Public Schools. Analysis of regression technique was used.

Findings and Conclusions: Correlations of variables, taken singly, and marks earned in industrial arts were: science, .5936; mechanical aptitude, .4128; IQ, .3607; mechanical interest, .1184; and manipulative, .0937. Two variables and criterion: science and mechanical aptitude, .6249; science and IQ, .6006; IQ and mechanical aptitude, .4696. Three variables, science, IQ, and mechanical aptitude, had a correlation of .6268. IQ was dropped without a significant loss.

2511. VEST, DONALD W. ***Improved Testing and Measurement in Iudustrial Arts.*** **M. S., 1950, Oklahoma Agricultural and Mechanical College. 60 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To determine the methods which may be used by instructional arts instructors to improve testing and measurements in their shop classrooms.

Source of Data: The method of study includes examination and excerpts from books, pamphlets, bulletins, magazines.

Findings and Conclusions: For the past several decades testing and measurement in industrial arts has been too subjective, and has been concentrated too much on manipulative skills. More recent trends are toward more and better objective testing. More emphasis should be placed on the use of tests in determining student difficulties, to motivate students, check on methods of instruction and as a means of evaluating teaching materials.

2512. WALLACE, ARCHIE M. (Masters). ***Objective Examinations in Manual Training.*** **University of Oklahoma, 1931.**

2513. WALTON, MAUDE S. (Masters). ***The Correlation of Teacher Ratings in Vocational Exploratory Courses with Test Scores of Mechanical Ability.*** **University of Southern California, 1928.**

2514. WARNER, RALPH LEO (M. A.) ***An Experimental Investigation of the Mechanical Abilities of Shop Students in the Junior High School.*** **University of Southern California, 1933. 94 p.**

An attempt to determine experimentally the interests, aptitudes, and mechanical abilities of shop students in the junior high school.

2515. WARNHOFF, DAVID (M. S. in Ed.). ***A Study of the Method Used by a Vocational High School in an Attempt to Solve the Problem of Selecting Entering Students Who Will Profit Most from the Training Given and More Satisfactorily Meet the Needs of Industry and Society.*** **Cornell University, 1938.**

2516. WELLS, CLARENCE R. (M. S.). ***Objective Classroom Tests in Sheet Metal Development.*** **Colorado Agricultural & Mechanical College, 1941. 125 p.**

A series of objective tests in sheet metal development. The tests aim to be useful to pupils and teacher in appraising pupil achievement in sheet metal layout work.

2517. WHERRY, DAVID MARSH (Masters). ***Mechanical Aptitude Testing: Its Development and Implications for Guidance in Industrial Arts.*** **Ohio State University, 1940.**

2518. WHITE, HENRY A. (M. S.). ***Correlation Between Mechanical Aptitude and Information Relating to Automobile Mechanics.*** **Iowa State College, 1940. 71 p.**

A comparison of five aptitude tests to determine their value in predicting success in auto mechanics. The five tests studies were: Stenquist Tests I and II, Detroit Mechanical Aptitude Test for Boys, DeForrest Automobile Test A1 and A2, Otis Self-Administering Tests, and Reed's Midget Wiggly Block Test.

◆ **2519. WIGHTWICK, BEATRICE FRANCES.** ***The Effect of Retesting on the Predictive Power of Aptitude Tests.*** **Ph. D., 1949, New York University. 205 p. Library, New York University, New York, and Library of Congress.**

Purpose: To determine effect of retesting on the predictive power of aptitude tests.

Source of Data: A series of aptitude tests were given to 218 boys and girls, tested repetitively; tests given 5 times at weekly intervals.

Findings and Conclusions: Increases in scores were consistent. Learning did take place during process of retesting. Pupils tended to retain their relative rankings on all of the tests.

2520. **WILSON, HARVEY RUSSELL.** *A Photographic Test in Tool Identification for a Senior High School.* M. S. in Ed., 1949, University of Southern California. 68 p. Education Library, University of Southern California, Los Angeles.

Purpose: To construct a new type of achievement test designed specifically for senior high school industrial arts general metal work. To use the photographic process in test construction. To check the reliability, validity, usability of the test. To compare test results with the term or semester grades of students tested.

Source of Data: Description of test constructed and statistical analysis of results.

Findings and Conclusions: The photographic technique has a definite advantage over other types of tests. The reliability of these tests was very high. The validity of the tests was fairly high. The technique could be applied to tests in many fields where it has not yet been tried.

2521. **WOODRUFF, CHARLES P.** (M. S.). *Attitudes of High School Pupils Toward Vocations and Their Relationship to Certain Other Variables.* Purdue University, 1937. 38 p.

The administration of the Harold Miller Attitude Scale for the purpose of determining the vocations high school pupils tend to choose and how these attitudes are effected by general shop and vocational information courses.

2522. **WRIGHT, HARRY MARVIN** (M. S.). *Development of a Test to Measure Achievement in Mechanical Drawing.* Purdue University, 1930. 25 p.

Two equivalent forms of a mechanical drawing test were prepared and administered to 193 engineering students for the purpose of determining their validity and reliability.

2523. **WUNDERLICH, AUGUST W.** (M. S.). *Testing Program for Vocational Machine Shop Trade Theory Classes.* Pennsylvania State College, 1930. 173 p.

Develops a series of tests to be used to check on pupil progress in the trade theory which is taught in conjunction with vocational machine shop practice. Several possible uses of these tests, other than the checking of pupil progress are evaluated.

2524. **ZIEFLE, HOWARD EDWARD** (M. A.). *The Relation of Certain Test Scores to Achievement in a General Vocational School Machine Shop Course.* University of Maryland, 1941. 42 p.

A statistical study, based on data from school No. 294 in Baltimore, Maryland, correlating six standardized test results to the school marks of seventy pupils in the machine shop course.

2525. **ZINN, CHARLES F.** (M. S.). *The Construction of Comprehensive Trade Tests Embracing the Technical Information Used in Relief Printing.* Pennsylvania State College, 1939. 92 p.

The construction of written objective-type tests of technical knowledge and related information pertaining to relief printing, as practiced in job, book, and newspaper printing establishments. A battery of tests to be used in selecting better trained men for teaching vocational printing is included.

Surveys

Educational Programs

2526. **ADAMS, ORVILLE D.** (Masters). *Adapting Efficiency Methods to Making a Survey of Conditions Surrounding Vocational Education in Medford, Oregon.* Oregon State College, 1932.

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2527. **AKEY, WAYNE WILBUR.** *Student Opinions Which Underlie the Selection of a Vocation.* Ed. D., 1952, University of California. 150 p. Library, University of California, Berkeley.

Purpose: To ascertain the occupational outlook of the worker by accumulating and analyzing normative data about opinions which underlie the selection of an occupation.

Source of Data: Data were obtained by questionnaire from 977 boys and 1,007 girls in the twelfth grade in eight high schools in San Francisco. The survey forms were administered by certain selected and trained personnel in each school.

Findings and Conclusions: Statistically significant differences existed between sex groups and school groups in gross level of occupational selection outlook. Alternate reliability coefficients of .76 and .69 for boys and girls respectively resulted from an analysis of 19 of the 22 items used. There was a significant difference of 10 per cent between the low scorers and high scorers on the 19 satisfactory items. More boys than girls cite professional and managerial occupations as probable. Boys generally express higher goals than girls. Girls more generally recognize teachers and counselors as sources of occupational information than boys.

2528. ALFORD, BOOKER T. *Industrial Arts in Oklahoma Junior High Schools in 1954.* M. S., 1954, Oklahoma Agricultural and Mechanical College. 68 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To aid in promoting progress and development in the industrial arts departments in the junior high schools of Oklahoma.

Source of Data: Data were obtained from questionnaires and books.

Findings and Conclusions: Most principals would expand the industrial arts department if funds were provided. Oklahoma junior high school teachers are well prepared.

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2529. ALLEN, WILSON S. (Doctors). *Industrial Education for Negroes in Secondary Schools in Florida with Special Reference to Industrial Arts Education.* Ohio State University, 1936.

2530. ALLISON, ASA CHESTER (Masters). *A Program of Industrial Arts and Industrial Education with Adaptation to the Massillon (Ohio) Public Schools.* Ohio State University, 1939.

2531. ANDERSON, RICHARD D. *The Need for Trade and Industrial Shops in South Dakota High Schools.* M. S., 1953, University of Wyoming. 84 p. Library, University of Wyoming, Laramie.

Purpose: To ascertain the need for trade and industrial shops in South Dakota high schools.

Source of Data: Data were obtained from a review of the literature and from letters of information from various parts of the state.

Findings and Conclusions: Few administrators knew the relationship between industrial arts and trade and industrial education. Less than 50 per cent of the high schools in South Dakota offered shop courses of any type. Seven per cent of the Schools offered trade and industrial shop courses in limited amounts. A vigorous promotional program for trade and industrial education should be established in South Dakota.

2532. ANDERSON, SIDNEY VINCENT. *Development Study of Industrial Arts in North Dakota.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 38 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To describe the present status and development of industrial arts in North Dakota.

Source of Data: Data were obtained from the writings of the leaders in the field of industrial arts, from courses of study and the annual reports of the State Department of Public Instruction.

Findings and Conclusions: Mechanical drawing, woodwork and general shop were the industrial arts courses taught most often in order of frequency. The depression seriously affected the offerings and enrollments in shop courses driving both in a downward trend. From 1934 until 1941 there was a rapid rise, the war again causing a drop. Good crops affected a rise again until 1950. Teacher shortages affected the program.

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2533. ANDERSON, W. CARLISLE. *Student Teaching in Industrial Arts Education.* Ph. D., 1954, University of Minnesota. 463 p. Library, University of Minnesota, Minneapolis.*

Purpose: To report current information and opinions concerning student teaching in industrial arts as it is administered in American colleges and unversities.

Source of Data: Data were obtaned from a questionnaire sent to 109 institutions of higher education and 104 cooperating secondary school industrial arts teachers, current literature, and administrative forms used in higher education institutions.

Findings and Conclusions: Current literature contains little information on industrial arts student teaching. "Methods" in industrial arts teaching is more often considered to be a departmental offering than is a course in "student teaching." About two-thirds of the campus laboratory schools have their own industrial arts shops. Sixty-two per cent of the teacher-training institutions remunerate critic teachers in some way. About one-third of the institutions assign student teachers for five or more hours per day. Combined student teaching and methods courses under the same instructor seems best.

2534. AXTHELM, EDWARD E. (M. S.). *Practices in Teaching Manual Arts in Iowa High Schools.* Iowa State College, 1930. 76 p.

An analytical survey of practices in teaching manual arts in Iowa high schools. Data covers the percentage of farm boys enrolled, type of projects, teacher preparation, grades in which industrial arts work is offered, work required for completion of course, salaries of teachers, tenure, shop appearance, and quality of work.

2535. BADEAUX, LESTER CHARLES. *A Study of the Post-High Plans of Students and Their Adequacy to Pursue Those Plans.* M. S., 1953, Louisiana State University. 113 p. Library, Louisiana State University, Baton Rouge.

Purpose: To formulate a basis for improving the services offered by Baker High School, to its students in preparing them to fulfill their post-high school plans.

Source of Data: Data were obtained through questionnaires from the 1952-53 juniors and seniors of Baker High School and from interviews with students who had not clearly defined their intentions on the questionnaire.

Findings and Conclusions: Students considered in the study had adequate basic education to pursue their post-high school plans. Personal desire to continue their education and interest in chosen vocations were listed as the most influential factor bearing of post-high school plans.

2536. BADGER, OZRO (M. Ed.). *A Quantitative Analysis of the Aspects of Vocational and Manual Arts Education.* Colorado Agricultural & Mechanical College, 1931.

2537. BAILEY, HARVEY P. (M. A.). *Survey of Organization and Methods of Industrial Arts Education in Secondary Schools of West Virginia,* West Virginia University, 1934. 56 p.

A survey of the facilities available for teaching industrial arts in the West Virginia schools in 1932. It considers the training which teachers of industrial arts had at that time and makes suggestions regarding the needs of the state for competent industrial arts teachers.

2538. BAKER, WILLIAM ROSS (M. A.). *Industrial Arts in the Integrated Program in the Elementary Grades.* George Peabody College, 1935. 100 p.

An analysis of state, county, city, and private school curricula to indicate the status given industrial arts by educators in the integrated program in the elementary grades.

2539. BALDWIN, WILLIS AMBROSE (Masters). *The Present Status of Industrial Arts in the Junior High Schools of California.* Oregon State College, 1940.

2540. BALLOU, STEPHEN V. *Education in the Paper Industry.* M. A. University of Colorado, 1947, 114 p.

A survey in the pulp and paper industry of training programs that exist in private institutions, in publicly supported institutions, and in industry itself. Methods for improvement are recommended.

2541. BARCLAY, EMERY C. *A survey of Industrial Arts in Junior High School Level in the Third Class Cities of the State of Kansas.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 37 p.

A brief description of industrial arts programs in seventh and eighth grades in the small schools of Kansas in 1941.

2542. BARICH, DEWEY F. (Masters). *Educational Implications of the Occupations in One Division of the Automobile Industry in Flint, Michigan.* University of Michigan, 1938.

2543. BARTON, EARALD H. *A Study to Determine to What Extent Selected High Schools in California Have Emphasized the General Educational Value in Industrial Arts Education.* M. A., 1949, Claremont Graduate School. 171 p. Library, Claremont Graduate School, Claremont.

Purpose: To focus the attention of administrators, directors of curriculum, industrial arts teacher training institutions and candidates for administrative credentials on the the degree of emphasis given to general educational objectives in industrial arts programs.

Sources of Data: One hundred forty-six check sheets were mailed to administrators of high schools in California having an enrollment of 200 to 1000 students. The check sheet provided for 5 degrees of emphasis in the answers and was composed of 40 statements based upon well-known educational objectives. The results were tabulated in table form and each statement analyzed in detail.

Findings and Conclusions: The survey indicated that there is considerable confusion in the thinking of the high school administrators concerning the educational potentialities of an industrial arts program; revealed little evidence that they had organized their industrial arts programs for the attainment of general educational goals; also revealed the need of further study in the field of industrial arts curriculum planning and in addition gave an indication that some work in vocational education and industrial arts should be included in the professional preparation of secondary school administrators.

2544. BASCO, LEON. *Work Load of the Industrial Arts Teachers in Louisiana.* M. S., 1953, Louisiana State University. 96 p. Library, Louisiana State University, Baton Rouge.

Purpose: To identify the types of activities required of an industrial arts teacher and to ascertain the relative amount of time spent in these activities.

Source of Data: Data were collected through an information form from 52 industrial arts teachers in the state.

Findings and Conclusions: Industrial arts teachers in Louisiana participate in many activities other than class-room instruction. On the average, teachers were required to be at school 32 hours and 10 minutes per week. In addition, the teachers spent an average of 25 hours and 41 minutes each week after school in activities directly and indirectly related to teaching. Teachers in small schools participated in more extracurricular activities than teachers in large schools.

2545. BEDARD, JOSEPH ARTHUR (Masters). *Objective Study of Newton Trade School: A Study of Academic Achievement, Pupil Progress, Teachers' Marks and Dropouts Based Upon Standard Achievement Tests.* Boston University, 1939.

2546. BEDNAR, ERNEST GEORGE. *Professional Preparation and Instructional Duties of Montana Industrial Arts Teachers.* M. S., 1950, Iowa State College. 45 p. Library, Iowa State College, Ames.

Purpose: To determine the duties, preparation and salaries of the 109 industrial arts teachers in the Montana secondary schools during the school year of 1948–1949.

Source of Data: Principal sources of data included: Annual Reports Relating to the Qualifications of Teachers in Secondary Schools for 1948–1949, Montana State Department of Education, and the U. S. Census Report.

Findings and Conclusions: Industrial arts teachers in the larger schools tended to have more experience, taught larger classes, received higher salaries, and taught fewer subjects in combination with industrial arts subjects than did those teachers in the smaller schools. Only 58 percent of the Montana industrial arts teachers had a major or a minor in that field. The remainder had no formal training in that field or were teaching on special permits due to lack of sufficient credits for a degree.

2547. BERNARD, CHARLES AUGUST, Jr. *In-Service Training in Industrial Arts for Elementary Teachers.* M. S., 1950, Louisiana State University. 114 p. Library, Louisiana State University, Baton Rouge.

Purpose: To ascertain the areas of learning to be incorporated in an in-service training program in industrial arts. The time and place to conduct the program for elementary teachers in Louisiana schools.

Source of Data: Analysis of responses to 451 questionnaires to elementary teacher.

Findings and Conclusions: Fifty-three were teaching industrial arts in the classroom. Twenty-two had their pupils take industrial arts in shops set up in elementary, junior high and senior high schools. Three hundred seventy-six offered no industrial arts to their pupils. The majority of the elementary teachers preferred to attend in-service training classes at night at convenient centers rather than pre-school workshops, summer, or Saturday classes. Interest was indicated in the following fields: The philosophy of industrial arts; the methods of teaching industrial arts; phases of organizing and planning instructional material; and shop organization and management.

2548. BERTO, U. JOHN (Masters). *A Survey of the Manual Arts in the*

Elementary and Junior High Schools. Washington University, 1939.

2549. BEST, GLENN EDWARD (M. A.). *A Study and Projection of Industrial Arts in West Virginia: Considerations in the Development of Secondary School Programs.* Ohio State University, 1937. 92 p.

A survey of the industrial arts program in West Virginia, the trends in modern secondary school education, and the importance of industrial arts in providing new methods and experiences. Some guiding principles for building a program in West Virginia are included.

2550. BETTS, J. D. (M. S.). *A Study of the Needs For Industrial Arts in the Affiliated Schools of Cass County.* A & M College of Texas, 1940. 41 p.

A study of the opinions of management and students in 1940 in Cass County, Texas to determine the need for industrial arts program.

2551. BIBB, HERMAN L. (Masters). *Industrial Education in Tennessee Colleges.* Iowa State College, 1947.

2552. BISHOP, ALVIN C. (M. S.). *To Determine to What Extent the Present Industrial Arts Program of the Highland Park Schools Serves the Actual Need of the Community.* North Texas State College, 1948. 63 p.

Investigates the educational interests and needs of boys enrolled in Highland Park Junior and Senior High Schools in 1948 to determine to what extent the industrial arts program was meeting their needs. Suggestions for improvement are offered.

2553. BISHOP, BENJAMIN J. (Masters) *A Survey of the Pupils Enrolled in the Perry Rural Schools of Morrow County, Ohio, from 1920–1935 for the Purpose of Meeting the Practical Arts Needs of the Community.* Ohio State University, 1935.

2554. BLAISDELL, JOHN ROBERT (M. A.) *Status of the Industrial Arts Teacher in Colorado,* 1939, Colorado State College of Education, 1939. 138 p.

An investigation showing the status of the teacher of industrial arts in Colorado through a study of the professional preparations, size of school, daily teaching schedule, trade experience, and salary.

2555. BLAUVELT, VAUGHN C. *A Survey of Industrial Arts in the County Schools in the State of Ohio.* M. S., 1953, Bowling Green State University. 69 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To show the relationship between the professional preparation and work experience of industrial arts teachers and the subjects taught, to compare the amount and kind of extra jobs done by the industrial arts teacher for the county and consolidated schools, to compare the alloted time for industrial arts in county and consolidated schools, and to ascertain the frequency of teaching combinations.

Source of Data: Data were secured by a questionnaire sent to the industrial art teachers of eighty-three counties of Ohio.

Findings and Conclusions: Although some industrial arts teachers do not meet state certification requirements, there is a trend for these teachers to secure training beyond the Bachelor's degree. The combination of industrial arts with social studies, physical science, biological science, physical education, and English are most frequently found. Trades and industries have supplied much training for industrial arts teachers.

2556. BLIDE, DALE C. (M. S.). *Status of Industrial Arts in One-Room Schools of North Dakota.* Iowa State College, 1936. 61 p.

A study of the extent that handiwork is being carried on in the rural schools of North Dakota and in teacher education institutions throughout the United States. Recommendations for improvement are offered.

2557. BOLLER, ALLEN T. (M. S.). *An Analysis of Industrial Arts Teacher Tenure in the State of Iowa.* Iowa State College, 1933. 46 p.

An investigation of the tenure of and subjects taught by industrial arts teachers in 1921–1922.

2558. BOYD, LESTER E. *Local Industrial Arts Resources Pertinent to Schools of Pinellas County.* M. Ed., 1950, University of Florida. 97 p. Library, University of Florida, Gainesville.

Purpose: To give a comprehensive view of the resources of Pinellas County which may contribute to the enrichment of the industrial arts program, and to better the relationships and understandings between the schools and their communities.

Source of Data: Data were obtained through questionnaires, conferences, Chambers of Commerce, Sextons Research Laboratory and various libraries.

Findings and Conclusions: The schools are making some use of the human and natural resources of the county, however, there are some good native resources that are not being utilized by the industrial arts program.

2559. **BRANDON, HARRY LESTER.** *A Survey to Determine the Possibilities of Improving the Course of Study in Mechanical Drawing in the Rural Secondary Schools of Middle Tennessee.* M. A., 1952, Middle Tennessee State College. 71 p. Graduate Division, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the nature and extent of mechanical drawing in the rural high schools of Tennessee.

Source of Data: Data were secured through questionnaires, interviews, and visits to mechanical drawing classes.

Findings and Conclusions: Mechanical drawing teachers are following textbooks too closely and are not taking advantage of available teaching aids. They are not attempting to promote their program outside the drawing room, and are not giving enough attention to individual differences. Mechanical drawing teachers are depending too much on drawing exercises alone for the determination of grades.

2560. **BRANCH, RAYMOND B.** (Masters). *A Study of the Vocational Program of the Nottingham Training School in Relation to Negro Farmers and 125 High School Pupils.* Hampton Institute, 1940.

2561. **BRAY, HORACE G.** (Masters). *The Value of Industrial Arts Training in the Alcoa High School as Judged by Former Pupils.* University of Tennessee, 1942.

2562. **BRIDGES, CHARLES E.** (M. S.). *Trends in Industrial Arts Enrollment and Occupational Opportunities in Vincennes, Indiana.* Iowa State College, 1948. 39 p.

A study of the trends of industrial arts enrollment in the schools of Vincennes, Indiana, and the opportunities for employment.

2563. **BROWN, JAMES HOWARD.** *Characteristics of Industrial Arts Curricula and Departmental Operation in the Public Schools of Outstate Nebraska.* M. A., 1954, University of Minnesota. 53 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To collect and organize data concerning certain characteristics of industrial arts departments and teachers in the public schools of Nebraska.

Source of Data: Data were obtained through a questionnaire sent to a random sample of high schools throughout the state.

Findings and Conclusions: Nearly one-half of the public schools in Nebraska do not offer industrial arts courses, and one-third of the schools that do offer such courses, have done so only within the last five years. About one-third of the industrial arts teachers have secured Masters' degrees and 65 per cent have obtained Bachelors' degrees. When compared with states like Minnesota, New York, California, Illinois and Indiana where strong teacher-training programs exist, Nebraska is woefully slow adopting practices which has made industrial arts course popular in these other states.

2564. **BRUMLEY, OSCAR H.** (M. A.). *The Status of Industrial Arts for Girls in the Secondary Schools of Ohio.* Ohio University, 1939. 76 p.

A study of the actual opportunities for girls to pursue industrial arts courses and of the actual participation by girls in these activities.

2565. **BUCHANAN, JESSIE CLEVELAND** (M. S.). *Status of Iowa Industrial Arts Teachers in 1944.* Iowa State College, 1946. 35 p.

A survey of 385 industrial arts teachers and the 345 schools where they taught. Twelve personnel items and five items relating to school data are compared.

2566. **BUCKLEY, CHARLES W.** (Masters). *A Study of the Industrial Arts Programs in the Eastern Vocational Teacher Education Area of Pennsylvania.* University of Pennsylvania, c. 1935–47.

2567. **BUEHLER, ORVILLE A.** *Teacher Training Data (Department of Industrial Education).* M. A., University of Minnesota, 1946. 100 p.

An analysis and summary of courses, enrollments, grades, and other details concerning the Department of Industrial Education from fall quarter 1925–1926 through summer 1935.

2568. **BUNDY, EUGENE A.** *The Status of the Industrial Arts Teacher in Iowa and His Instructional Problems.* M. A., 1950, Colorado State College of Education. 161 p. Library, Colorado State College of Education, Greeley.

Purpose: To present the status of the industrial arts teacher in the elementary schools in Iowa, and also to present the instructional problems.

Source of Data: Data for this study were obtained from questionnaires sent to all of the teachers of industrial arts in Iowa.

Findings and Conclusions: Ninety-eight and nine tenths percent of the teachers have a bachelor's degree. The professional preparation of the teachers of Iowa has been obtained from 112 institutions in 27 States and Canada. The main reason for the influx of teachers is salary. Salaries in Iowa are higher than in Colorado, Missouri, Nebraska, and Arizona. Industrial arts is fast becoming a full-time subject as 89 percent of the classes in the study meet five days per week. A great many of the smaller schools in Iowa have added industrial arts to their curriculum because of the demand, without actually having a place in their school plant for such classes.

2569. **BURLEIGH, RALPH WENDELL** (M. A.). *The Status of the Instruction of Aeronautics in the Schools of California.* University of Southern California, 1930. 80 p.

A discussion of aeronautics instruction in the schools of California in terms of curriculum, course content, and methods, and with particular emphasis on lack of standardization.

2570. **BURNES, CHARLES A.** (M. S.). *Courses in Industrial Arts for High Schools Based on a Survey of Present Offerings in North Carolina.* Iowa State College, 1941. 67 p.

A study of the industrial arts courses most commonly taught in the various grades in white high schools in North Carolina.

2571. **CAPIELLO, DAVID A.** *A Comparative Study of the Scholastic Achievement of Selected Groups in the Industrial Arts Department of a Teachers College.* M. S. in Ed., 1949, *Cornell University.* 79 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To compare the scholastic achievement of graduates of vocational and technical high schools and the graduates of general high schools.

Source of Data: Information concerning the high schools attended, the high school averages, and the aggregate four year college averages were tabulated from permanent records on file in the office of the college registrar. The grades in the various courses of the curriculum were tabulated from permanent departmental records on file in the office of the industrial arts department. The groups selected were the entering classes of 1932, 1933, 1934, 1935, and 1936 in the Industrial Arts Department of the New York State College For Teachers at Buffalo.

Findings and Conclusions: The general high school group achieved a higher aggregate average in the English, mathematics, social studies, and shop courses than did the vocational-technical group. The vocational-technical high school group achieved a higher aggregate average in the education, mechanical drawings and arts, science, and elective courses than did the general high school group. The high school aggregate average of the vocational-technical and general groups were 82.456 and 80.565 respectively. The college aggregate averages of the vocational-technical and general groups were 2.357 and 2.376 respectively. The general group had a higher percentage of graduates and fewer drop outs than the vocational-technical group.

2572. **CARLILE, OLYN C.** (M. S.). *A Survey of the Industrial Arts Program and Teacher Qualifications in Public Schools of Arizona.* Iowa State College, 1931. 123 p.

A survey of industrial arts teachers in the public schools of Arizona to obtain data on the following topics: subject combinations, teaching loads, size of classes, extra-curricular duties, special duties, homework, school maintenance work, and experience.

2573. **CARVER, LOWELL** (M. S.). *Survey of Junior High School General Shop Courses of Study.* Iowa State College, 1937. 104 p.

A review of the content and general trends of general shop courses of study in the junior high schools in the United States.

2574. CASSIDY, FRANK E. *The Status of Industrial Arts in Arkansas.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 119 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To make available assembled data which will be of value to school board members, superintendents, teachers, and the public, and to analyze the assembled data to show an accurate picture of industrial arts in Arkansas.

Source of Data: The questionnaire technique was used to obtain data for this study. Available information was collected from the annual reports from the North Central and accredited schools available in the office of the State Department of Education, and in college catalogues.

Findings and Conclusions: This study may be used to answer these questions: Number of schools offering industrial arts and trade and industrial education courses including diversified occupations in Arkansas; the size of the schools offering these courses; the certification requirements for industrial arts and trade and industrial education teachers; colleges providing teacher education programs for industrial education in Arkansas; salaries of industrial education teachers in that State.

2575. CHAMBERLAIN, DUANE G. (Masters). *A Study of Shop Work in Small High Schools in the State of Michigan.* University of Michigan, 1940.

◆ **2576. CHAVOUS, ARTHUR MELTON** (Ph. D.). *Industrial Education for Negroes in Ohio.* Ohio State University, 1945. 176 p.

Examines the general environment in which Negroes live in Ohio and recommends practices and policies in the field of technical and industrial education which may operate to limit some of the inequalities placed on Negroes.

2577. CHRISTENSON, BERNARD F. *An Analysis and Comparative Study of the Objectives of Industrial Arts and General Education in Order to Determine the Relationship of Industrial Arts to General Education.* M. S. 1950, North Texas State College. 64 p. Library North Texas State College, Denton.

Purpose: To make an analysis of the objectives of industrial arts and general education to determine whether the objectives are meeting the needs of youth.

Source of Data: The data for this study were secured from books, pamphlets, booklets, and professional magazines on the subjects of general education, industrial arts, needs of youth, democracy in education, and education in general.

Findings and Conclusions: As a result of this study it was concluded that in reorganizing the curriculum, or devising a course of study for any subject, the needs of youth and the areas of living approach should be considered as a primary factor. General education is broad and flexible. It deals with the needs and interests of the students. Industrial arts contribute to the partial fulfillment of many of the basic needs of youth.

2578. CHUMLEY, JOSEPH GALE. *A Syllabus of Fifteen Styles of Period Furniture.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 73 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To supply a brief summary of several of the most important styles of furniture as developed through the centuries, and to point out significant and identifying characteristics of each through actual photographs and other types of illustrations.

Source of Data: The library method was used, though some material was obtained from manufacturers of period furniture.

Findings and Conclusions: History reveals that certain dominating influences invariably affect the style of architecture, decorations, textiles, pottery, and other articles. Period furniture is the designation given to furniture which was favored, or obtained popularity, during certain historical eras. Each style or period has its individual characteristics which plainly set it apart from other styles. Each period has its own economic and social history.

2579. CHUSTZ, ROY F. (M. S.). *A Program of Industrial Arts for Elementary Schools of Louisiana.* Louisiana State University, 1947. 110 p.

A study of the status and need for industrial arts in the elementary schools of Louisiana, with suggestions for organization, method, and teacher training.

2580. COBB, WILLIAM LENOX (M. S.). *Provisions for Vocational Education for Negroes in the High Schools of Texas.* University of Southern California, 1940. 91 p.

A study of the problem of vocational education for Negroes in Texas from the points of view of the variety of offerings, the quality (in terms of teacher qualification), the demand, and the great need for vocational guidance facilities.

2581. COLLINS, KATHERINE KENNEDY (M. A.). *A Critical Survey of the Occupational Exploratory Courses in the Junior High Schools in Los Angeles.* University of Southern California. 134 p.

A study of specific classes in junior high schools in Los Angeles, including all occupational fields. An attempt was made to separate successful from unsuccessful classes and to analyze the reasons for failure.

2582. CONNER, DANIEL J. (Masters). *A Survey to Determine the Establishment of an Industrial Arts Course in a High School,* Massachusetts State College, 1938.

2583. CONNOR, SISTER MARY BAPTIST, S. H. G. *Vocational Education for Catholic Negro Youth in Certain Southern States.* M. A., 1948, Catholic University. 46 p. Library, Catholic University, Washington. D. C.

Purpose: To determine the amount and kind of vocational education provided for Catholic Negro youth in ten southern states having segregated school systems. The study also sought information as to whether the lack of provision for vocational education has brought about the loss of students in passing from the Catholic elementary school to the high school.

Source of Data: Questionnaires were sent to principals of 26 high schools in the several states and data were obtained from 21 respondents.

Findings and Conclusions: The 21 respondents constituted 73 percent of the total number of Catholic Negro high schools in the South. Two of these schools had an enrollment of more than a hundred students (1943–1944). The correspondingly small faculty makes a differentiated program difficult to provide. Among the vocational subjects, sewing and cooking were offered more frequently than commercial or industrial subjects and these programs were of recent origin (girls constituted 75 per cent of enrollment). There was a 10.1 percent loss of pupils between grammar school and high school. Of the 30 pupils not continuing, 23 went to public schools.

2584. CORBETT, ARTHUR CHARLES. *A Mobile Shop Unit for Oregon's Rural Schools.* M. S., 1955. Oregon State College. 76 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the extent of industrial arts in rural schools in Oregon and the practicability of using a mobile shop unit to extend this training.

Source of Data: Data were secured from literature, mobile units in operation, manufacturers, and a questionnaire to rural schools.

Findings and Conclusions: A high percentage of the rural schools had no industrial arts. Those offering industrial arts had limited offerings with woodworking occurring most frequently. All schools expressed a desire to add industrial arts or increase their existing offerings. It was felt that a mobile unit would be of assistance to meet this need.

2585. CRAMER, CARL C. (M. S.). *A Study of Industrial Arts as Offered in Thirty High Schools in Northern Illinois.* Colorado Agricultural and Mechanical College, 1932. 65 p.

A survey of the background of the instructors and of industrial arts courses at thirty Northern Illinois high schools. Courses are compared with those offered at Northern Illinois State Teachers College.

2586. CRAWFORD, HARRY HUSTON (M. A.). *The Status of Instruction in Aviation in Public Secondary Schools in the United States.* University of Southern California, 1932. 86 p.

A study of the initial adjustment of the school curriculum to the air age. The problems of instruction and the goals sought are outlined.

2587. CRAWFORD, JAMES J. (M. A.). *An Analysis of Programs and Facilities for Teaching Trade Electricity in Schools of Western Pennsylvania.* University of Pittsburgh, 1933. 53 p.

A study of the vocational electricity program as it existed in 1932–1933. Information includes the location of schools, the nature of the program, classification of the type of work offered, methods of instruction in shop work, books used for text and reference work, extent and nature of equipment, amount of capital

outlay, arrangement and storage of tools and supplies, and contact with industry in placement service and co-operative work.

2588. CROWTHER, JOHN EDWARD (M. A.). ***Early Effects of the World Conflict on the Industrial Arts Program in the San Antonio Junior Schools.*** **University of Texas, 1945. 63 p.**

A descriptive study of the problems encountered in operating industrial arts programs during World War II. Industrial arts enrollments, courses, class sizes, teacher preparation, and costs in eight junior high schools, 1938–1944, are examined.

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2589. DANIELS, BLAIR E. (Doctors). ***Technical and Industrial Education in the Public Schools of Mexico.*** **Temple University, 1937.**

2590. DAS, RADHA C. (M. S.). ***Some Basic Considerations for the Development of Industrial Education in Orissa (India).*** **Cornell University, 1948. 127 p.**

An analysis of the needs for industrial education in the province of Orissa (India). The techniques of occupational survey, job analysis, curriculum construction, school plant layout, and their application to the development of a program of industrial education in the province are discussed.

2591. DAVIES, ROY LLOYD. ***The Status of Sixty-Five Industrial Arts Teachers and Their Shops.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1941. 62 p.**

A description of the qualifications of 65 industrial arts teachers and their teaching facilities.

2592. DAVIS, H. (Masters). ***A Study of the Opinions of Graduates from the Industrial Curriculum at the South Philadelphia High School with Reference to the Benefits which They Have Derived from their Educational Experiences in the School.*** **University of Pennsylvania, c. 1935–47.**

2593. DAVIS, HENRY CLARENCE (M. A.). ***Status and Possibilities of Industrial Arts in Virginia.*** **Kent State University, Kent, Ohio, 1949. 200 p.**

A survey of industrial arts in Virginia from its beginning, with emphasis on the post 1930 period, to determine the need for industrial arts teacher education. The Virginia program is compared with other state programs.

2594. DAVIS, ROBERT F. ***A Survey of the Industrial Arts Departments of the Public Secondary Schools of the Northern Area of California.*** **M. A., 1954, Chico State College. 95 p. Library, Chico State College, Chico, Calif.**

Purpose: **To ascertain the general status of the industrial arts departments in the public secondary schools in the northern area of California.**

Source of Data: **Data were secured through a questionnaire sent to the principals of public secondary schools in the area.**

Findings and Conclusions: **Ninety-three per cent of the schools offered industrial arts courses. Schools usually had one or two instructors. Eighty-eight instructors had Bachelor's degrees and eleven had Master's degrees. Half of the schools had less than one hundred enrolled in industrial arts courses and thirty per cent indicated there were no girls enrolled in these courses.**

2595. DAVISON, ALEX REED (M. S.). ***A Study of Trends in the Industrial Arts Metals Area in Oregon Secondary Schools.*** **Oregon State College, 1942. 94 p.**

A study, based on questionnaire returns, of the facilities for metalwork in the small schools of Oregon. The need for more diversification of the Oregon programs is considered.

2596. DAYMON, ARTHUR L. (Masters). ***Exempted Village High Schools of Ohio—Industrial Arts Programs.*** **Ohio State University, 1942.**

2597. DECKER, LLOYD K. ***A Study of Industrial Arts Offerings in the Consolidated Schools in Michigan.*** **M. A., 1949, University of Michigan. 64 p. Education Library, University of Michigan, Ann Arbor.**

Purpose: **To study the industrial arts offerings in the consolidated schools of Michigan in relation to teacher preparation, facilities for instruction, and the instruction of industrial arts.**

Source of Data: First an historical account was given of the relationship of rural education to urban education; the place of the consolidated school in rural education; the role of industrial arts education in the public schools and the industrial arts programs in the consolidated schools of Michigan. In addition, material was obtained from the files of the State Department of Public Instruction, showing the returns from the annual self-survey of Michigan schools and of rural agricultural schools, 1947–48, made by the Department.

Findings and Conclusions: Significant conclusions: Approximately 30 percent of the consolidated schools have no industrial arts instruction at the high school level. In no school were there any formal industrial arts courses offered prior to the seventh grade. Over 50 percent of schools offering industrial arts courses have only one room for such instruction. Approximately 80 percent of instructors in industrial arts meet the generally accepted standards for academic training. About 4 in 5 instructors had more than the 16 hours minimum of required college courses in industrial arts subjects. About 10 percent of these schools have available more than one instructor qualified for industrial arts instruction. The equipment available for industrial arts instruction in over 50 percent of the consolidated schools was inadequate for efficient instruction even in the basic processes, and only 4 percent had an equipment evaluation suitable for a balanced and comprehensive program. The lack of coordination of offerings on a State-wide basis showed itself in the disproportionate number of schools offering woodwork and drawing to those offering general shop and home mechanics. Recommendations were made to alleviate the conditions described above.

2598. DEVORE, JAMES A. *Provisions for Teaching Industrial Arts in Seven Iowa Counties.* M. S., 1950, Iowa State College. 109 p. Library, Iowa State College, Ames.

Purpose: To examine the existing industrial arts programs in Clark, Decatur, Lucas, Marion, Monroe, Warren, and Wayne Counties of Iowa.

Source of Data: Data were collected by means of a check list sent to each school offering industrial arts in the 7 selected counties.

Findings and Conclusions: Twenty-five of the 33 industrial arts departments were located in the high school building. Twenty-four of the 33 industrial arts departments were located on the first floor; 7 shops were located in the basement, and 2 were located on the second floor. Nineteen out of the 33 schools in this study had a 1-room industrial arts department; 8 of the schools had 2-room departments; and 4 schools had 4-room departments. The average size of the classes in the 1-room industrial arts departments consisted of 10 pupils; the 2-room departments had an average of 13 pupils per class; the 3-room departments were found to have larger classes with an average of 16 pupils per class, and the 4-room departments had an average of 15 pupils per class.

2599. DIGBY, CLEO E. (Masters). *A Survey of Curricula and Facilities for Teaching Industrial Arts in County Schools of Cuyahoga County, Ohio.* Bowling Green College, 1940.

2600. DONNELLY, HAROLD G. (Masters). *An Analysis of the Program of Industrial Arts in New York City.* St. John's University, 1942.

2601. DONOVAN, GEORGE R. *Relationship Between Size of School, Professional Preparation, Experience, and Salaries of Teachers in Iowa Towns With Less than 2,500 Population.* M. S., 1951, Iowa State College. 87 p. Library, Iowa State College, Ames.

Purpose: To ascertain the relationships between certain factors and teachers' salaries in Iowa communities of less than 2,500 population.

Source of Data: The teachers were divided into four groups: male high school teachers, female elementary and high school teachers, male elementary teachers, both male and female elementary and high school teachers. The variables were: quarter hours preparation; years of experience; and school size.

Findings and Conclusions: Groups 1, 2, and 4 were best predicted by all three variables.

2602. DORSEY, GLEN E. (Masters). *The Status of Manual Arts and Industrial Vocational Education in Nebraska.* University of Wisconsin, 1931.

2603. DOUGLAS, LESLIE. *The Boy's Trade School, An Occupational Training Center.* M. A., 1950, Ohio State University. 51 p. Education Library, Ohio State University, Columbus.

Purpose: To make a status inquiry of the Boys' Trade School in Columbus, Ohio. Particularly concerned with those students of high school age who are not being adequately prepared for life by existing school programs.

Source of Data: Description and analysis of the services and opportunities offered at this school; attempt to evaluate the program for retarded boys; and examination of the characteristics of attending students.

Findings and Conclusions: The inquiry shows that very definite service is being performed by this school and its program in the community. Recommendations are made for its continuance and expansion suggested. A program suited to the aptitudes and abilities of the student group is presented.

2604. DRAZICH, NICK R. ***Elementary School Industrial Arts.*** **M. A., 1950, Ohio State University. 91 p. Education Library, Ohio State University, Columbus.**

Purpose: To determine the nature of an industrial arts program as a functional part of the elementary school curriculum and to understand the values to be received from such a program.

Source of Data: A review of the literature pertaining to Ohio's elementary industrial arts program with special attention given to the Cleveland, Cincinnati and Ohio State University Schools.

Findings and Conclusions: An increasing number of educators are supporting the viewpoint that industrial arts experiences have an important role in the elementary curriculum; special equipment and rooms are not absolutely necessary for the development of an organized program of industrial arts activities; the experimental schools and the success of existing programs in a limited number of public schools can serve as valuable aids in the promotion of similar programs in other schools; the activities of elementary industrial arts are designed to serve the ultimate purpose of the schools—to prepare the individual for participation as a citizen in an industrialized democracy.

2605. DUGGER, RODERIC R., Jr. (M. A.) ***A Study of Industrial Arts in the Secondary Schools of Florida.*** **University of Florida, 1948. 122 p.**

This study reveals the current status of industrial arts in Florida and indicates future trends. A shortage of qualified instructors is reflected by a three-fold increase in the number of industrial arts students at teacher training institutes.

2606. DUSEK, DONALD JOSEPH. ***Industrial Arts Teachers In Nebraska (1952–53).*** **M. A., 1954, University of Minnesota. 96 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To ascertain the status of industrial arts teachers in Nebraska.

Source of Data: Data were obtained through a questionnaire sent to participating schools and from the files of the State Department of Education, Lincoln, Nebraska.

Findings and Conclusions: Industrial arts teachers in Nebraska are weak in professional writing, reading professional literature, graduate work in their field and trade experience. Professionalization in their training has been poor. The industrial arts teachers carry too heavy a load and move too often to establish a good program.

2607. DYAS, EDWIN W. ***Industrial Arts in the Schools of Nebraska.*** **M. A., University of Minnesota, 1948. 144 p.**

A cross section of the industrial arts teacher, his job, and the programs that exist in the public and private schools of Nebraska.

2608. DYCHE, RAY M. ***A Study to Determine the Need of Industrial Arts Education for Girls in the Secondary Schools in the State of Texas.*** **M. S., 1950, North Texas State College, 95 p. Library, North Texas State College, Denton.**

Purpose: To investigate the present need of industrial arts for girls in the secondary schools of Texas and to determine the need, if any, for a change in the program to better meet these needs.

Source of Data: A survey was made and needs presented with a description of related studies. Ideas of the needs of industrial arts education for girls were gathered from books and magazine articles. Additional data were secured by questionnaire from industrial arts teachers in the secondary schools of Texas.

Findings and Conclusions: Only 8 schools in the State of Texas (at the time of this study) offered classes only for girls, with an enrollment of 623 girls. Twenty-six schools had an enrollment of 1979 girls in boys' industrial arts classes. The seventh grade offered more opportunity for girls to take industrial arts. Seventy-one per cent of the teachers interviewed think that provisions for girls are inadequate. The offerings for girls included mechanical drawing, home planning, electrical appliances, leather craft, household tools, landscaping, wood craft, furniture design, plastics, and home mechanics.

2609. DYE, CLARENCE H. (M. ed.). ***A Vocational Training Program for Students Employed in Seventh-Day Adventist College Industries.*** **Colorado Agricultural & Mechanical College, 1945. 99 p.**

A study of college programs and catalogues with an aim toward improving the vocational training for youth in the Seventh-Day Adventist educational system. Suggestions for improvement are included.

2610. EADES, JERRY. ***Industrial Arts in Oklahoma Junior High Schools.*** **M. S., 1950, Oklahoma Agricultural and Mechanical College. 89 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: Purpose of the study was to find: Number of schools offering courses in industrial arts. Courses included in the industrial arts program, what types of industrial arts shops are needed, salary of the industrial arts teacher, and the manner in which industrial arts contribute to the junior high school curriculum.

Source of Data: Documentary and questionnaire.

Findings and Conclusions: One hundred sixty-two junior high schools include industrial arts in their curriculum. The industrial arts courses most frequently offered are general shop and unit shop-woodwork. Annual salary for teachers with bachelor's degree, average, $2859, and for master's degree, $3404. Industrial arts courses for the seventh grade are almost wholly required and for the ninth grade are entirely elective.

2611. EASLEY, MILTON CURTIS. ***A Survey of Occupational Therapy as Used in the Winter Veterans Hospital, Showing its Relationship to Industrial Arts.*** **M. S., 1951, Kansas State Teachers College. 91 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To show the occupational therapy activities that are being carried on at the Winter Veterans' Administration Hospital at Topeka, Kansas and to indicate the relationship between occupational therapy and industrial arts.

Source of Data: Data were obtained from personal visits made at the hospital and interviews with the administrators, the heads of the occupational therapy clinics, and with some of the occupational therapists.

Findings and Conclusions: Practices in occupational therapy were found to be effective and in line with modern ideas of progressive education. Value was placed on patient interest, attitude, and need. Close relationship exists between occupational therapy and industrial education. There is a definite difference in the aims and objectives of the two fields.

2612. EASTERLY, CLAY A. (M. S.). ***A Survey to Determine the Opportunities for Improving the Program of Vocational Education in Bristol, Tennessee-Virginia.*** **University of Tennessee, 1940. 116 p.**

A study of the senior classes, 1939–1940, in two senior high schools, together with an occupational survey of 115 industrial establishments in the Bristol area, to determine the value of conducting high school programs for the benefit of those who expect to enter college.

2613. EGGERT, MYERS R. ***Status of Missouri Industrial Arts Instructors.*** **M. S., 1950, Iowa State College. 63 p. Library, Iowa State College, Ames.**

Purpose: To ascertain the status of industrial arts in Missouri in regard to qualifications, duties, and salaries.

Source of Data: Data were secured from the State Department of Education, Jefferson City, Missouri.

Findings and Conclusions: Of the 357 instructors reporting, 28.5 per cent had Master's degrees, 61.7 per cent had Bachelor's degrees, and 9.7 per cent had no degree. The median number of years in teaching was 14.06. The median number of class periods taught per week was 29.51; 66.1 per cent were full-time industrial arts. The median salary was $2930.

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2614. ELDER, WALTER TREADWAY (Ph. D.). ***A Study of Industrial Arts in Pennsylvania.*** **University of Pittsburgh, 1941.**

A state-wide study to determine the present offerings and needs for industrial arts in Pennsylvania. Recommendations for improvement are offered.

2615. ELLIS, JAMES C. ***A Study of the Needs and Interests of the Students as Related to The Industrial Arts Curriculum of Highland Park Junior High School and Boude Story Junior High School, Dallas, Texas.*** **M. S., 1952, North Texas State College. 93**

p. Library, North Texas State College, Denton.

Purpose: To find out how well the needs and interests of students taking industrial arts in the Highland Park and the Boude Story Junior High Schools were being met.

Source of Data: Data were obtained through the use of questionnairies that were completed by the students and their parents, from professional literature, and personal interviews.

Findings and Conclusions: The interests and needs of the students of both schools were very similar. Both schools should increase the number of courses offered in industrial arts and a greater range of industrial arts activities should be included in the curriculums.

2616. ENGLAND, LURAD R. (M. A.). *The Status of Industrial Arts in the State of Kentucky.* Western Kentucky State College, 1947. 63 p.

A study of the type and scope of industrial arts subjects or activities being taught, based on questionnaires sent to teachers of industrial arts. Factors regarding the organization of industrial arts work are considered.

2617. EVERHART, FRANK M. (M. S.). *A Survey of the Industrial Arts Libraries in Junior and Senior High Schools with an Enrollment of 200 or over in the Western Half of Florida.* Iowa State College, 1933. 110 p.

A survey of the library content of fifty-two Iowa high school libraries. The author, title, and frequency of 365 industrial arts books are given. The following topics are also treated: location of the library, selection and purchase of books, loaning and cataloging systems, and methods of handling periodicals.

2618. FALES, ROY G. (Masters). *Present Status of Industrial Arts in New York State.* New York University, 1931.

◆ **2619. FARMER, JOE HAROLD.** *The Teaching of Industrial Arts in the Secondary Schools of Texas.* Ed. D., 1950, New York University. 133 p. Library, New York University, New York.

Purpose: To investigate the industrial arts programs carried on in one hundred and fourteen four-year public high schools of Texas during 1948–1949.

Source of Data: Data obtained from recent bulletins from the State Department of Education, a questionnaire, and visits to 31 schools.

Findings and Conclusions: The industrial arts program in Texas did not meet the specified aims and objectives to any large degree. Few aids were available from the State Department of Education. A majority of the teachers had less than sixty hours of college credit in industrial arts and many failed to meet the state's minimum requirement. The industrial arts standards, regulations and restrictions were not adequate to provide a well-rounded program for the state.

2620. FEARS, HENRY, Jr. *A survey of the Subjects Contained in State Industrial Arts Publications in the United States.* M. S., 1952, Agricultural and Mechanical College of Texas. 42 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To analyze the content of current state industrial arts publications, to stimulate industrial educators to offer suggestions as to the content of these publication, and to check the Texas publication with those of other states.

Source of Data: Data were secured from books, bulletins and surveys.

Findings and Conclusions: This survey set forth possible subjects and viewpoints which might be contained in a new publication for Texas.

2621. FEIRER, JOHN L. *Industrial Arts Teachers in Minnesota.* M. A., University of Minnesota, 1938. 117 p.

A comprehensive profile of the typical Minnesota industrial arts teacher; his training, certification, experience, load, salary, etc.

2622. FIFE, JOHN GERMAINE (M. S.). *Status of Industrial Arts Teachers in Louisiana.* Louisiana State University, 1939. 64 p.

A study on the extent of industrial arts in Louisiana in 1939 with emphasis on information concerning the teaching personnel. Facts on salary, education, and fields of concentration are presented.

2623. FINK, CHARLES (Masters). *Judgments of Alumni Concerning the Vocational Value of the Courses Offered by Three Technical High Schools in Chicago.* Northwestern University, 1932.

2624. **FISKE, ROBERT K.** *The Status of Graduates of the New York State School of Industrial and Labor Relations Involving the Undergraduate Curriculum.* M. S. in Ed., 1950, Cornell University. 90 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To study and evaluate the required courses of the school by securing opinions of former students.

Source of Data: A questionnaire was sent to 97 graduates of the school, up to and including the class of September, 1948. Seventy-one questionnaires were returned.

Findings and Conclusions: Future graduates of the industrial and labor relations program should be in a position to offer both functional skills and experience to prospective employers along with college preparation. As the age level of graduates declines, work in industry prior to college training would seem to be of great advantage as preparation for college and for offering a more mature person to an organization after graduation.

2625. **FLETCHER, GLENN FOSTER (M. Ed.).** *The Development, Administration and Present Status of Industrial Arts Education in Texas High Schools.* The University of Texas, 1937. 82 p.

A survey of the development of industrial arts courses in Texas high schools, 1896–1937, their frequency, type of school, content, and administration.

2626. **FLYNN, LEROY (M. A.).** *A Study of the Vocational and Pre-Vocational Content of the Curricula of the Catholic Secondary Schools in the States West of the Mississippi River.* The Catholic University of America, 1947. 60 p.

A study of 328 Catholic secondary schools to determine their curricula content. It indicates that the vocational content of the curricula is practically nonexistent and recommends changes in order to meet the vocational preparation needs of the pupils.

2627. **FORSEA, HAROLD L. (M. S.).** *A Survey of Certain Phases of Selected General Shop Programs in Secondary Schools West of the Mississippi River.* Oregon State College, 1943. 135 p.

A comparative study of eight aspects of the general shop, including such items as the original general shops versus conversions, required versus elective courses, rotation in junior high schools compared to senior high schools, and methods of starting classes.

2628. **FOWLER, EWELL W. (M. S.).** *A Study of the Industrial Arts Exploratory Course Offered in the Junior High Schools of Amarillo, Texas.* A & M College of Texas, 1937.

An investigation of the extent to which the objectives of industrial arts were being fulfilled in the junior high school of Amarillo, Texas, in 1937.

2629. **FRANKLIN, M. E. (Masters).** *A Survey of Industrial Arts in the State of Oklahoma as a Basis for a Teacher Training Program.* Northeastern Teachers College, 1931.

2630. **FRAWLEY, NORMAN T.** *The Public School Program for the Vocational Training of Veterans at Knoxville, Tennessee.* M. S., 1953, University of Tennessee. 130 p. Library, University of Tennessee, Knoxville.

Purpose: To examine the public school program for vocational training of veterans at Knoxville, Tennessee.

Source of Data: Data were secured from minutes of the Knoxville Board of Education, and from records in the business manager's office and the Fulton Vocational Training Center.

Findings and Conclusions: During the period of operation, courses were conducted in 14 trades for whites and five for negroes. Grand total enrollments were 2,824 whites and 459 Negroes. There were 962 who completed training courses and 994 who accepted employment prior to completion. This program definitely contributed to the employment needs of the Tennessee Valley area at a time when skilled craftsmen were badly needed.

2631. **FREESE, ALBERT JOSEPH.** *Industrial Arts Graduates of Illinois State Normal University—A Survey, 1946–1950.* M. S., 1951, Illinois State Normal University. 53 p. Library, Illinois State Normal University, Normal.

Purpose: To present an analysis of the present-day industrial arts teachers duties and responsibilities, his professional status, his teaching difficulties and weaknesses, the causes of failures, his need for more adequate training, the difficulties encountered by the beginning teacher, and the need for in-service training of teachers.

Source of Data: Data were obtained by a questionnaire sent to graduates of Illinois State Normal University, 1946–1950, with a major in the field of industrial arts.

Findings and Conclusions: A course such as methods and materials, to be taught in the industrial arts department, is considered important enough to be recommended by 94.11 per cent of the respondents. The area of metalwork was considered to be the area of greatest value in their preparation. From the data presented, the major difficulties encountered by the beginning teacher are as follows: problems of discipline, weak personality traits, lack of knowledge of subject matter.

2632. FRENCH, EARLE KENNETH (Masters). *Effect of the Depression upon the Industrial Arts Program in Certain Massachusetts School Systems.* Boston University, 1936.

2633. GATES, FLOYD C. (M. S.). *A Survey of Industrial Arts from the Parents' Point of View in Wood County, West Virginia.* Ohio University, 1939. 47 p.

A study which deals with the situation in Parkersburg and vicinity in 1939. It suggests that the aims and objectives of the several areas in the school program should be understood by the parents in order to get their cooperation.

2634. GILL, ARTHUR W. (M. A.). *A Survey of the Opportunity School of Denver, Colorado.* Colorado State College of Education, 1930. 185 p.

A comprehensive study of seventy-one similar part time schools, and the Opportunity School in particular.

2635. GLENN, ROBERT HENRY. *An Analysis of the Qualifications and General Status of the Industrial Arts Teachers Employed in the Secondary Schools of Arkansas During the 1953–1954 School Year.* M. S., 1954, North Texas State College. 89 p. Library, North Texas State College, Denton.

Purpose: To ascertain the qualifications, general status, and in-school activities of the industrial arts teachers employed in Arkansas as compared with industrial arts teachers employed in Texas.

Source of Data: Data were obtained through the use of a questionnaire and other recent and related studies.

Findings and Conclusions: The qualifications of the teachers were actually lower than the requirements established by the Arkansas State Department of Education. Industrial arts teachers in Arkansas receive $427.02 less annually than the average teacher in the state of Texas. The majority of the teachers belonged to a vocational organization on both the state and national level rather than to industrial arts organizations.

2636. GODFREY, MARIELLA P. *Contributions of Women to the Industry of United States During World War II.* M. A., 1949, Catholic University. 50 p. Library, Catholic University, Washington, D. C.

Purpose: To consider the contributions of women to industry in the United States during World War II.

Source of Data: A survey of public documents, reports, magazines and newspaper articles was made. Correspondence was carried on with directors of information in major industries and the Women's Division of the Department of Labor.

Findings and Conclusions: Women readily accepted the responsibilities of production and distribution. The number of women workers increased by over six million during five years. In an incredibly short time women attained a high degree of efficiency; their willingness to learn and the execution of their assigned jobs contributed to their success. Industry came to realize the occupational possibilities of women and new fields were opened to them. The hitherto accepted belief that women were unstable was discredited by statements of supervisors and the achievement record as found in total production. Industry would have been crippled without the assistance of women during World War II.

2637. GOFF, WALTER EARLE (M. A.). *A Survey of Industrial Arts Education in the Teachers Colleges of the United States.* Southwest Texas State College, 1940. 105 p.

A survey of the status of industrial arts teacher education in teacher colleges up to 1940.

2638. GREENE, FRANK T. (M.S.). *The Status of Industrial Arts in the Secondary Schools for Negroes in Virginia, West Virginia, and North Caro-*

lina. Iowa State College, 1932. 62 p.

A questionnaire study to determine the extent and nature of industrial arts work which was being taught to Negroes in 1931 in the public schools of the states of Virginia, West Virginia, and North Carolina.

2639. GREGG, LOWELL ALBERT. *Enrollments in Industrial Arts in the Secondary Schools of Ohio.* M. A., 1950, Ohio State University. 38 p. Education Library, Ohio State University, Columbus.

Purpose: To describe the development of industrial arts in the public schools of Ohio during the school year 1948–1950.

Source of Data: Comparisons were made of enrollments of the various school districts. Comparisons included information about total enrollments and the percent of students taking industrial arts in the various districts.

Findings and Conclusions: Industrial arts in county districts were influenced by the area in which they were located. County systems with the higher percentage of enrollments were located near industrial areas. The agricultural and rural areas appeared to have the smallest programs. Enrollments in the city and exempted village districts were not influenced by location. The percentage of enrollments was larger as the enrollments of the school districts increased. The stronger industrial arts program seemed to be a result of the attitudes of school administrators rather than the geographic location of the areas in which they were located.

2640. GRIESS, JERALD ALFRED. *The Status of Industrial Arts in Nebraska Senior High Schools, 1954–1955.* M. S., 1955, Oklahoma Agricultural and Mechanical College. 47 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the status of industrial arts in the state of Nebraska, with respect to offerings and the professional preparation, experience, tenure, salary, and special duties of the teacher.

Source of Data: Data were obtained through questionnaires sent to three hundred thirty-seven industrial arts teachers, and from records in the State Department of Public Instruction.

Findings and Conclusions: Few teachers hold degrees with majors in industrial arts. Woodworking and drawing are the most frequently offered industrial arts subjects. There is a definite lack of variety in subject matter.

2641. GRINSTEAD, NOEL B. (M. A.). *Industrial Arts in the Senior High Schools of Ohio.* Ohio State University, 1928. 137 p.

A report of an inquiry directed to the principals of senior high schools to determine their viewpoint on educational values and procedures. It includes a study of the shortcomings of industrial arts and suggests methods of improving the situation.

2642. GROGAN, JOHN F. *The Status of Vocational Trade Shop Teachers in the Public Secondary Schools of New York State (1947–1948).* M. S. in Ed., 1949, Cornell University. 104 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To study the current status of teachers in the field of vocational industrial education.

Source of Data: Library research and analysis of material submitted to the State Education Department, Vocational Division, by trade teachers.

Findings and Conclusions: Within the next two decades there will be a tremendous demand for trained trade shop teachers to replace teachers who will retire. Because of trade and industrial experience requirements the trade shop teacher is usually 10 to 15 years older, at the beginning of his teaching career, than the academic teacher. The marked difference in the salary scale found in different parts of the State cannot be explained by variations in living costs, nor amount of work required.

2643. GRUSE, GEORGE M. (M. S.). *The Justification of a General Drawing Course for High School Boys Interested in Technical Work in College.* The Stout Institute, 1940. 39 p.

Entrance requirements of forty-three state universities and thirty-two technical and liberal arts colleges in the United States were analyzed to verify the acceptance of a general drawing course in the Ross High School, Fremont, Ohio.

2644. GUERRA, JOSEPH STEVENS (M. Ed.). *A Comparison of the Qualifications of Industrial Arts Instructors in City, Exempted Village, and County Schools in the State of Ohio.* Ohio State University, 1942. 60 p.

From the files of the State Department of Education in Columbus, the author gathered data regarding the qualification of industrial arts teachers in Ohio at the beginning of World War II. Comparisons are made regarding tenure and salary of teachers.

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2645. HACKETT, DONALD F. *The Status and Need for Industrial Education in Georgia.* Ed. D., 1953, University of Missouri. 183 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the status and need for industrial education in the white public schools of Georgia.

Source of Data: Information was obtained by means of information forms and interviews, from records in the State Department of Education, and from the United States Census. Requirements for employment in the manufacturing industries, trends in industrial employment, and opinions of employers, school administrators, parents, and high school graduates were analyzed for their implications.

Findings and Conclusions: There were 146 industrial arts teachers in eighty-nine schools in sixty-five Georgia cities with an average salary of $3,417 in 1952–53. Three-fourths of the industrial arts programs had been in operation less than fifteen years. General shop courses were provided in fifty-four of the seventy-two schools reporting. The twenty diversified cooperative programs in Georgia enrolled 470 trainees in sixty-two different occupations in 1952–53; average salary of coordinators was $3,560; eleven programs had been in operation less than ten years. Fifty day-trade teachers were found in ten schools with an average salary of $3,689 in 1952–53; these programs enrolled 759 high school students in twenty different day-trade classes. High school graduates and parents were overwhelmingly in favor of some form of industrial education being provided in the public schools of Georgia. Employers ranked mathematics, English, trade training, and industrial arts first, second, third, and fourth, respectively, in importance among school subjects. High school administrators reported the probable addition of 160 industrial arts teachers, 34 coordinators, and 19 day-trade teachers in the period 1953–56. The findings of this study would indicate that some form of industrial education is both necessary and desirable in Georgia schools.

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2646. HAHN, BRUCE JACKSON. *A Study of State Associations for Industrial Arts Teachers, With Recommendations for the Colorado Association.* Ed. D., 1953, Colorado State College of Education. 223 p. Library, Colorado State College of Education, Greeley.

Purpose: To make recommendations which might improve the effectiveness of state associations for teachers of industrial arts.

Source of Data: Data were secured from a questionnaire sent to all state industrial arts associations, and a questionnaire sent to Colorado industrial arts teachers.

Findings and Conclusions: State association presidents believe purposes of state association to be: exchange of information and opinion for improvement of instruction; promotion of industrial arts among patrons, administrators, teachers and pupils; and evaluation of present programs and methods. Colorado teachers listed their preferences as to number of meetings, cost, kind of meetings, how to keep informed, and projects to be carried out.

2647. HAHN, HENRY G. *The Status of High School Industrial Arts in Second Class Cities.* M. S. in Ind. Ed., Kansas State Teachers College, 1942. 37 p.

A description of the industrial arts programs offered in second class cities in Kansas in 1942.

2648. HALL, EVERETT V. (M. S.). *The Status of the Industrial Arts Work in the Consolidated Schools of Iowa.* Iowa States College, 1933. 79 p.

A comparison of industrial arts education and other subjects as they are taught in the consolidated schools. Topics include objectives of the work in various schools, industrial arts subjects being taught, the extent of correlation of mechanical drawing and woodwork, training of instructors, books in the libraries, and student interest in industrial arts.

2649. HAMILTON, THOMAS G. *How Practical Arts Education Has Functioned in Mexico.* M. S., North Texas State College 1938. 150 p.

A descriptive study of the nature of practical arts education in Mexico.

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2650. HARLAN, OWEN. *Comparison Of Scholastic Records Of Students From Academic, Vocational, And Technical High Schools In The Industrial Arts Division Of A Teachers College.* Ed. D., 1953, University of Missouri. 158

p. Library, University of Missouri, Columbia.

Purpose: To compare graduates of academic, vocational and technical high schools with respect to their high school records, their abilities and their success in industrial arts teacher-training.

Source of Data: From the official records of 567 students who matriculated in the industrial arts division of the New York State College for Teachers at Buffalo between February 1946 and September 1949, data were taken relative to high school marks, performance on college entrance examinations, and marks in college courses. Correlations techniques were used in handling the data.

Findings and Conclusions: Although the vocational group had the highest record of high school achievement, it fell below both the academic and technical groups in college achievement. The technical group made the highest record of college achievement in spite of relatively low high school achievement records. Grade averages of 90 or above in any of the high school curricula, or part thereof, seemed to indicate ability to satisfactorily complete this program. Grade averages below 75 indicated only a 50–50 chance of graduating from the college. Technical high school graduates seemed to be good prospects for industrial arts education programs and more of these students should be recruited for such programs. Special courses in mathematics, English, and science should be offered for vocational high school graduates so that they can correct these deficiencies before they are admitted to the regular industrial arts curriculum. There is a definite need in industrial arts education for more students with a strong high school background.

2651. **HARMS, WILLIS OTTO (M. S.).** *Industrial Arts Libraries in the Public Senior High Schools of Central Illinois.* Iowa State College, 1937. 135 p.

A study of methods used by fifty-five schools in central Illinois for selecting and handling industrial arts library material.

2652. **HARRIS, FRANCIS H. (M. S.).** *Industrial Arts in North Central Association Negro Schools of Oklahoma.* Iowa State College, 1942. 49 p.

An investigation of the industrial arts courses offered in four Negro schools of Oklahoma. Teachers salaries are also discussed.

2653. **HARRISON, PAUL E. (M. A.).** *A Survey of Industrial Work in the Schools of Northern Illinois.* Colorado State College of Education, 1931. 128 p.

A comprehensive study of the status of industrial arts and industrial arts teachers in Northern Illinois.

2654. **HART, WILLIAM KEITH.** *The Teaching of Industrial Arts in Tennessee Junior and Senior High Schools, 1950–51.* M. S., 1951, University of Tennessee. 134 p. Library, University of Tennessee, Knoxville.

Purpose: To ascertain the status of industrial arts in Tennessee junior and senior high schools.

Source of Data: Data were secured by a questionnaire.

Findings and Conclusions: The present industrial arts program in Tennessee was fairly well standardized. Professional training of teachers was at an exceptionally high level. State Teacher institutions provided basic training for more than 90 per cent of teachers, with Middle Tennessee State College at Murfreesboro leading in number trained. Average number of years of teaching industrial arts was 9.3. Average annual salary was $3,107.00. Industrial Arts classes were reported at grade levels 7 through 12, with the greatest number of schools offering ninth grade courses.

2655. **HARTER, LELAND IVOR.** *An Industrial Arts Program for a Small High School.* M. S., 1954, Oregon State College. 75 p. Library, Oregon State College, Corvallis.

Purpose: To examine the industrial arts programs of the small high schools of Oregon and to suggest an improved program.

Source of Data: Data were secured by a questionnaire.

Findings and Conclusions: Industrial arts is offered in 69 per cent of the small high schools. It is less than a full-time program in 84 per cent of the schools studied. Beginning woodwork, advanced woodwork, general shop, general drafting, and advanced general woodwork constitute 89 per cent of the total industrial arts areas offered.

2656. **HARWOOD, ELMER ERNEST (M. S.).** *A Study of the Practices Employed in Manual Arts Instruction in the Regular Elementary Schools of California.* University of Southern California, 1939. 108 p.

A study of industrial arts programs in 165 schools in California to determine whether or not they afford their students the opportunities to learn the use of simple hand tools.

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2657. HAWKINS, LESLIE V. *An Analysis of the Contributions of Industrial Arts to the General Education of All College Students.* Ed. D., 1953, The Pennsylvania State University. 257 p. Library, The Pennsylvania State University, University Park.

Purpose: To secure the opinions of college students, college graduates, and personnel in higher education and to obtain their suggestions on some of the needs of college students in the areas of handicrafts, consumer knowledge, and handyman activities.

Source of Data: Data were secured by three questionnaires sent to college students, college graduates, and personnel of higher education. A study was made of the various phases of handicrafts, consumer knowledge, and handyman activities.

Findings and Conclusions: College women and women graduates, although lacking in experience at home and in secondary schools, have high interest in some areas of shop activities. Little agreement existed on the type of crafts or hobbies that should be offered in colleges, but the majority agreed that individuals should have a creative hobby. A range of 84 to 98 per cent of the three groups surveyed recommended that colleges provide a workshop which would be available to all students regardless of curriculums. Judging the merits of common industrial products found in the home or office, in consumer knowledge showed the best prospect of being general education. The area of handyman activities as a whole did not have as much appeal for students as did consumer knowledge, with the exception of some individual areas. Women graduates were as interested in handyman activities as in consumer knowledge. In all but a few items, interests and recommendations were far greater than the experience of the three groups surveyed.

2658. HAYES, RUSSELL, A. *Analysis of Plans for Pre-Induction Training During World War II.* M. S., 1953, Stout State College. 83 p. Library, Stout State College, Menomonie, Wis.

Purpose: To analyze war-time pre-induction courses with respect to objectives, purposes, areas, and content in order to find guiding principles for the post-war industrial arts program.

Source of Data: Data were obtained from books, articles, and bulletins published in the early part of World War II, containing information about the induction training courses.

Findings and Conclusions: The aim of the Pre-Induction courses—Fundamentals of Electricity, Fundamentals of Machines, Fundamentals of Shopwork, Fundamentals of Automotive Mechanics, Fundamentals of Radio—was to develop sufficient skill in each specialty, with emphasis on the pre-induction needs of youth, in the shortest possible time and to give the instruction to as many at the same time as the teacher can well instruct, thus securing the greatest economy of time. In general, there was an evident tendency on the part of instructors to think more clearly, to fix definite objectives, to evaluate these objectives, and to meet them in terms of methods and subject matter.

2659. HEALAS, DONALD VREELAND. *A Study of the Outstanding Achievement Award Winners of the Industrial Arts Program Sponsored by the Ford Motor Company For the Years 1950 to 1953.* M. Ed., 1955, Wayne University. 103 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To gather information pertaining to the schooling, hobbies, home workshops, and types of gainful employment of the outstanding achievement award winners, and to learn what influence this award had on these youth.

Source of Data: Data were gathered by a survey and the personal observations of the writer.

Findings and Conclusions: These award winners were attending high school, going to college, employed mostly in technical fields, and in the armed services. Thirty-eight had home workshops. Their hobby interests covered fifty-three areas. Most of them planned on going to college.

2660. HENSON, IRA DELTON. *A Status Study of Industrial Arts Offerings in a Number of Urban Communities in the United States.* M. A. E., 1953, University of Florida. 69 p. Library, University of Florida, Gainesville.

Purpose: To compile a descriptive account of industrial arts offerings in urban areas in the United States.

Source of Data: Data were obtained by questionnaires sent to superintendents of public instruction and industrial arts supervisors.

Findings and Conclusions: All systems studied regarded industrial arts as essential, and all allowed credit toward graduation for industrial arts work. Twenty-seven of the thirty-four cities offer industrial arts to both boys and girls. Shop types are almost evenly distributed between unit, general unit, and general.

2661. **HICKMAN, OGLE JACK.** *A Survey of the Manual Skills of 567 Farmers.* M. S. in Ind. Ed., Kansas State Teachers College, 1942. 71 p.

A study of manual skills of farmers and the conditions under which they are performed.

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2662. **HILL, CHARLES RANDALL.** A Study of the Status and Need for Industrial Education in Missouri. Ed. D., 1950, University of Missouri. 241 p. Library, University of Missouri, Columbus.

Purpose: To ascertain the status of industrial arts, diversified occupations, day-trade classes, industrial teacher education, the personnel in charge of these programs, and the need for an expanded program of industrial education in the public schools of Missouri.

Source of Data: Data concerning the status of industrial education and the teachers of this work were obtained from records at the State Department of Education and by means of information forms. Data concerning the need for industrial education were obtained by sampling the opinions of school administrators, employers, parents, and high school graduates over the State.

Findings and Conclusions: Recent high school graduates, parents, and employers are overwhelmingly in favor of the public schools providing industrial education. They believe, however, that the subject should be added to the present program rather than replacing existing subjects. These groups are more interested in diversified occupations and industrial arts than in day-trade classes. One hundred and sixteen industrial education programs will probably be added in the State during the 1950–52 school years. Eighty-six are to be industrial arts, 20 diversified occupations, and 2 day-trade classes. At least 93 additional industrial education teachers will probably be needed for the 1950–51 school year. Seventy-four will be required for industrial arts, 13 for diversified occupations, and 6 for day-trade classes. Approximately one-fourth of the industrial education teachers to be added during the 1950–52 school years are to be employed by reason of reorganized school districts, granting, of course, the unknown effect of the reclassification program.

2663. **HILL, PATTON JOSEPH (M. A.).** *Vocational Education in the Negro Senior High Schools of West Virginia.* Indiana University, 1934. 315 p.

A study which attempts to discover the extent to which the Negro senior high schools are prepared to teach vocational education. It considers efforts made toward assisting Negro adolescents in selecting a life vocation, and compares the provisions for the teaching of vocational education with those for the teaching of academic courses.

2664. **HINTON, HERMAN F. (M. A.).** *Vocational Education for War Production Workers in Florida.* University of Florida, 1945. 53 p.

An investigation of the Federal-financed program of trade and industrial training for students of less than college age in Florida during World War II. Consideration is given to future vocational programs.

2665. **HOFFMAN, C. E.** *A Survey of Woodwork in Junior and Senior High Schools in Second Class Cities of Kansas.* M. A., University of Kansas, 1930. 67 p.

A description of the status of woodwork instruction in 76 Kansas high schools.

2666. **HOGAN, JEREMIAH B.** *Facts Concerning Turnover of Industrial Arts Teachers in Minnesota for the Five Year Period, 1945–1951.* M. A., 1951, University of Minnesota. 76 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide a factual picture of the employment situation as related to industrial arts teachers in Minnesota.

Source of Data: Data were obtained from questionnaires and personal interviews.

Findings and Conclusions: There is a strong tendency for teachers to remain in the same position. The greatest movement of teachers occurred two years after the war. Salaries and placement outlook are better. Industrial arts teachers and school departments that are growing have a stabilizing effect on the permanency of industrial arts in the school curriculum.

2667. **HOLCOMB, CHARLES W. (M. A.).** *A Study and Proposal to Meet the Vocational Education Needs in Creek and Okmulgee Counties, Oklahoma, Which Have Resulted Since the*

School Transportation Laws in Oklahoma. Western State College of Colorado, 1938. 50 p.

A study based on vocational needs which developed after Oklahoma had passed free transportation to school laws. The laws increased rural school population, and vocational education needs were reported.

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2668. HOLTROP, WILLIAM F. (Ed. D.). *The Development and Present Status of Vocational Education in the Netherlands.* University of California at Los Angeles, 1948. 297 p.

This study reviews the Dutch state-supported program of vocational education on the elementary, secondary, and technical college level from the middle of the nineteenth century to the present. Topics such as the effects of the Act of Vocational Education, enrollment, women's technical education, apprenticeship training by industry, primary objectives of vocational education, and curriculum are discussed from information collected from primary sources in the Netherlands in 1939 and 1947.

2669. HORNING, JAMES J. *A Survey of Practical Arts in Seventh Day Adventist Four-year Secondary Schools in California With Emphasis on Industrial Education.* M. A., 1953, Chico State College. 60 p. Library, Chico State College, Chico, Calif.

Purpose: To ascertain the status of the practical arts offerings of the four-year secondary schools of the Seventh-Day Adventist Church in California with special reference to industrial education.

Source of Data: Data were obtained from school bulletins, a questionnaire, and personal visits to the schools.

Findings and Conclusions: The most popular practical arts offerings are woodworking, typing, home economics, bookkeeping, auto shop, printing, mechanical drawing, and agriculture. Several strong vocational schools for students not interested in college should be established.

2670 HORSLEY, ARENA MAE (M.A.). *The Educational Status of Negro Industrial Employees in Terre Haute and Indianapolis, Indiana.* Indiana State Teachers College, 1933. 43 p.

A study of the occupations of parents of Negro students in two schools in Indianapolis and three schools in Terre Haute in an effort to use the data for improving the educational program for the Negro youth in the two cities.

2671. HORSTMAN, HENRY (M.A.). *The General Shop Curriculum in Nebraska Schools.* Colorado State College of Education, 1933. 81 p.

A study of the general shop in Nebraska through investigating kinds, texts, shop courses offered, course combinations, and extent of pupil selection of projects.

2672. HORTON, GILBERT A. (Masters). *The Extent, Nature and Objectives of Industrial Arts for High School Girls in the States of Texas, Alabama, Louisiana and Mississippi, for the Year 1932-1933.* Iowa State College, 1933.

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2673. HUBBARD, LOUIS HERMAN (Doctors). *The Place of Vocational Training as an Objective of the Woman's College.* University of Texas, 1930.

2674. HUFFAKER, WILLIAM FRANKLIN (M.S.). *A Program of Vocational Education for Chattanooga, Tennessee.* University of Tennessee, 1949. 82 p.

A review of the growth of the vocational education program in the Chattanooga public schools, with special emphasis on the period since 1935. The future needs of the program, based upon present employment, employment possibilities, vocational class enrollment, and increasing interest in vocational education, are discussed.

2675. INGRAHAM, LEO LeROY (M.S.). *Status of Printing Instruction in the Public Secondary Schools of California.* University of Southern California, 1936. 113 pp.

A study of the methods and scope of printing instruction in secondary schools in California.

2676. ISAAC, EUGENE L. *Status of Mississippi and South Carolina Negro Day Trade Teachers in 1949.* M. S., 1950, Iowa State College. 47 p. Library, Iowa State College, Ames.

Purpose: To compare the trade experience, professional qualifications, salaries and duties of the Negro day trade teachers of Mississippi and South Carolina for the 1949–1950 school year.

Source of Data: The Division of Vocational Education, State Department of Education, Mississippi and South Carolina, were the main sources of data.

Findings and Conclusions: A slight difference existed in the professional training of the teachers of Mississippi and South Carolina, but the salaries of the South Carolina teachers were much higher than the salaries of the Mississippi teachers. More industrial education subjects were offered in South Carolina than in Mississippi. Negro day trade teachers are able to do graduate work in the State of South Carolina, but the Negro day trade teachers in Mississippi are not able to do graduate work.

2677. JEFFERIES, ARCH H. (M.A.). ***The Status of the Teacher of Industrial Arts in Kansas, 1940.*** **Colorado State College of Education, 1940. 111 p.**

A personnel study of industrial arts teachers of Kansas which concerns itself with professional preparation, salary comparisons, and factors which affect salary determination.

2678. JEFFREY, DORSE B. (M. S.). ***An Analysis of the In-School and Out-of-School Activities of Industrial Arts Teachers in Oklahoma.*** **Oklahoma A & M College, 1937. 83 p.**

A survey of the in-school and out-of-school activities of 131 industrial arts teachers representing 109 schools in Oklahoma.

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2679. JENKINS, JAMES, *Jr.* ***Content (Tool Manipulations, Information, and Attitudes and Habits) of Required Industrial Arts for Boys as Developed from the Expressed Experiences of Youth, Adults, and Industry.*** **Ed. D., 1955, The Pennsylvania State University. 167 p. Library, The Pennsylvania State University, College Station.**

Purpose: To find what tool manipulations, information, and attitudes and habits that could be taught in industrial arts are the most useful to most people.

Source of Data: A questionnaire containing 490 items of instruction in industrial arts was evaluated on a four point scale of usefulness by 1893 junior high school boys, 262 laymen, 109 shop foremen, and 51 labor leaders. The respondents were selected from all over the United States. The mean ratings were found for various classifications of respondents and recorded in tables. The reliability of means and differences necessary for significance at the .05 level of confidence was figured and anlaysed.

Findings and Conclusions: The study developed a list (pages 149–154) of items of instruction in industrial arts that the respondents considered most useful. The items receiving the highest ratings may be classified as safety, attitudes and habits, and general care of tools and machinery. The study did not indicate that a different list of items of instruction should be used in different geographic areas or in communities with predominately different occupational classifications of its citizens for the basic content (common learnings) of required industrial arts for boys.

2680. JEPSEN, CARL S. (M. S.). ***Industrial Arts Libraries of Arizona Schools.*** **Iowa State College, 1942. 44 p.**

An investigation of high school libraries in Arizona to determine the number and quality of books on woodworking.

2681. JOHNSON, ARVID N. (M. S.). ***A Study of the Industrial Arts Program in the Senior High Schools of Lincoln, Nebraska.*** **The South Institute, 1940. 38 p.**

A survey of high school boys in Lincoln, Nebraska, showing that the interests of these boys were met in all areas of industrial arts except metalwork. Consideration is given to the amount of industrial arts offerings in Lincoln, Nebraska.

2682. JOHNSON, CYRIL W. (M. A.). ***An Appraisal of Industrial Arts.*** **Ohio State University, 1940. 108 p.**

An appraisal of industrial arts in the secondary schools of West Virginia. The philosophic bases and purposes of industrial arts are presented with a division of the industrial arts structure between the "material" factor and the "human" factor.

2683. JOHNSON, LAWRENCE MOLLE (Masters). ***The Introduction of a Program of Vocational Education in the Canal Zone Colored Schools.*** **George Washington University, 1934.**

2684. JOHNSON, RUFUS C., *Jr.* (M. Ed.). ***Vocational-Industrial Education for Negroes in the United States.*** **Pennsylvania State College, 1935. 67 p.**

All phases of vocational industrial education for the Negro in the United States have been investigated for the period 1619 to 1935. The trend of occupational selections of Negro students and the occupational status of the Negro in the United States is given as of 1930.

2685. JOHNSON, RUSSELL ARTHUR. *The Shop Library in Junior and Senior High School Industrial Arts Departments.* M. Ed., 1954, Colorado Agricultural and Mechanical College. 103 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the status and needs of junior and senior high school industrial arts shop libraries in the State of Colorado.

Source of Data: Data were obtained from a review of the literature, from questionnaires, and from a checklist.

Findings and Conclusions: Shop libraries are favored by industrial arts teachers and administrators and their number is increasing. Industrial arts teachers have the responsibility of shop libraries. The shop library is an aid to the teacher and student.

2686. JONES, CALVIN GRANT. *Work Permits and Street Trades Permits in Iowa, 1949.* M. S., 1950, Iowa State College. 73 p. Library, Iowa State College, Ames.

Purpose: To ascertain certain relationships concerning work permits and community correlates.

Source of Data: Data were secured for 628 cases for which work permits were filed and 2,128 cases for which street permits were filed in 1949.

Findings and Conclusions: Two-thirds of the permits were issued to males. Fifty per cent of the cases had completed elementary school and were continuing their education. Over one-half of the permits were issued during the summer. Seventy-five per cent of the applicants for street permits were 13 years or older.

2687. JONES, DANIEL MORGAN. *Teacher Training in Trade and Industrial Education in Tennessee Under Federal Vocational Education Acts.* M. S., 1949, University of Tennessee. 82 p. Library, University of Tennessee, Knoxville.

Purpose: To record the achievements and accomplishments of the teacher training program in Tennessee in Trade and Industrial Education under the Federal Vocational Education Acts.

Source of Data: Data were secured from unpublished master's theses, Federal bulletins, The University of Tennessee Record, reports of the Tennessee State Board for Vocational Education; and letters, reports, bulletins, and records in the office files of the Department of Industrial Education, University of Tennessee.

Findings and Conclusions: A curriculum was first approved in 1920 leading to the degree of Bachelor of Science with a major in Industrial Education. The program was initiated by and has been administered by the Department of Industrial Education, University of Tennessee, in cooperation with the State Division of Vocational Education, Trade and Industrial Service. Graduate courses leading to the Master of Science degree were first approved and offered in the Summer Quarter of 1928. A list is given of recognized authorities in the field and various staff members from the Trade and Industrial Service of the United States Office of Education who have served on the Summer Quarter faculty. A large number of industrial education courses are available both on the undergraduate and graduate level which not only lead to a degree, but which are necessary to meet State Plan requirements. District Supervisors serve as instructors for extension classes during the school year. The teacher training staff made a definite contribution to the war effort by conducting professional training for instructors under the Training Within Industry Service of the War Manpower Commission and by conducting training for supervisors in industrial plants. Recommendation is made for the continuance of the present teacher training program; the plan of offering courses in intensive 4-week terms; and the practice of rating teachers on the basis of professional courses completed. It is also recommended that additional work conferences be held by the staff to develop more standardized instructional material for uniformity in extension teaching and for pooling of experiences involving the effectiveness of the several courses.

2688. JONES, GORDON RUSSELL. *A Study of Industrial Arts Class Sizes in Forty-Two Towns and Cities in the State of Missouri.* M. S. in Ind. Ed., Kansas State Teachers College, 1941. 20 p.

An account of class size in 42 Missouri schools having enrollments of from 200 to 5000 in 1941.

2689. JONES, SAMUEL. *Vocational Training Opportunities for Negroes* *in Louisiana.* M. S., in Ind Ed., 1950, Kansas State Teachers College. 105 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To secure a comprehensive picture of vocational industrial training facilities available for Negroes in the State of Louisiana.

Source of Data: Questionnaire and correspondence with directors, principals, and instructors of the public and private vocational schools of Louisiana. Catalog analysis of course offerings.

Findings and Conclusions: High schools offered training in carpentry, woodwork, and mechanical drawing most frequently. Colleges offered training in several areas either for teacher preparation or vocational specialization. Guidance and placement as such were virtually non-existent. No concerted plan exists for the improvement and expansion of training facilities.

2690. JORDAN, TROXEY V. *Industrial Arts in the Public Schools of Memphis, Tennessee.* M. S., 1953, University of Tennessee. 125 p. Library, University of Tennessee, Knoxville.

Purpose: To ascertain the status of the industrial arts program in the public schools of Memphis, Tennessee.

Source of Data: Data were obtained by a questionnaire sent to all the industrial arts teachers of Memphis, from the annual reports of the board of education, and from the records of the Director of Vocational Education.

Findings and Conclusions: A majority of the teachers held one or more degrees. Tennessee colleges and universities conferred degrees on 75 per cent of the teachers. Beginning industrial arts classes were found in eight and ninth grades. Half of the schools used general shop classes.

2691. JULSON, KENNETH L. (M. A.). *General Industrial Training in Montana—A Survey of Current Practices Concerning Industrial Arts in the Public Schools.* University of Minnesota, 1935. 144 p.

An analytical description of the development and current problems of industrial arts in Montana schools. It includes a study of the teacher, his preparation, age, experience, and his professional attitude. Recommendations are made for those interested in planning and developing a program of industrial arts on the administrative, supervisory or teacher training levels.

2692. JURKOVICH, JOHN. *A Comparison of the Programs of Industrial Arts in Minnesota Schools, 1937–38 and 1947–48.* M. A., 1949, University of Minnesota. 64 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To study secondary school offerings in industrial arts, enrollments, instructors, programs, schedules, loads, salaries, and other items.

Source of Data: Study of annual reports on file in the Minnesota State Department of Education for the preparation of comparison tables for the two years.

Findings and Conclusions: Both regression and progression changes have taken place. Curriculum in majority of schools is quite narrow. Increased number of schools failing to meet minimum State requirements for period length. Many schools failing to receive the maximum special State aid. Split programs not reduced in number. Increase in number of departments. Gradual extending to high school level. Increase in number of girls enrolled. Trend toward longer school day. Trend toward 25 hours weekly teaching load for instructors.

2693. KASTLER, JOHN ORDWAY (M. S.). *A Study of Parent Opinion of Manual Training in the New Orleans Public Elementary Schools for White Children.* Louisiana State University and A & M College, 1939. 52 p.

A tabulation and analysis of parent's opinion concerning the elementary industrial arts program.

2694. KENNEDY, GEORGE (M.A.). *Vocational Education in England for Boys.* University of Pittsburgh, 1936. 118 p.

A survey to discover the types of vocational training given for boys in England and to discover the trades in which school training has been established to supplant the old type apprentice training.

2695. KENNEDY, T. A. (Masters). *Opportunity for Industrial Training in the Civilian Conservation Corps Camp Program.* Oklahoma A. & M. College, 1935.

2696. KENNERLY, ROLLIN (M.S.). *The Teaching of Industrial Arts in North Carolina High Schools.* University of Tennessee, 1938. 127 p.

A study of industrial arts in North Carolina high schools during 1937 to 1938, as to the courses being taught, the enrollments in each course, and the variety of textbooks used. A brief history of the development of industrial arts from the sixteenth century to 1917 is included.

2697. **KENNEY, RAY DALTON,** (M.Ed.). *Influences Determining Areas in Industrial Arts for Grade 7, 8, and 9 as Listed by Industrial Arts Instructors in Greater Cincinnati.* Ohio State University, 1941. 53 p.

A survey of the offerings in industrial arts at the junior high school level in Cincinnati in 1940–1941, based on the opinions of the instructors who were teaching these courses.

2698. **KERR, J. THOMPSON.** *A Study of the Libraries of Industrial Arts Teachers and More Particularly Those Doing Graduate Work at Pittsburg.* M. S. in Ind. Ed., Kansas State Teachers College, 1937. 42 p.

A study of the shop libraries of industrial arts teachers, giving characteristics and use.

2699. **KERRESSEY, (Brother)** (M.A.). *A Study of the Vocational and Prevocational Content in the Curricula of the Catholic Secondary Schools of New England and the Middle Atlantic States.* Catholic University of America, 1947. 52 p.

An analytical description of the vocational and prevocational course offerings in 733 Catholic secondary schools during the 1944–45 term. Consideration is given to the educational needs to meet the vocational education problem.

2700. **KETTERLING, REINHOLD HERBERT.** *The Status of Graphic Arts Instruction in the Industrial Art Programs in the Public Schools of the State of Washington.* M. Ed., 1953, Western Washington College of Education. 78 p. Library, Western Washington College of Education, Bellingham.

Purpose: To ascertain the status of the graphic arts program in the industrial arts departments and the plans for its extension.

Source of Data: Data were secured by a questionnaire sent to industrial arts teachers in the State.

Findings and Conclusions: Graphic arts instruction in the industrial art programs of the state was very limited. Administrators showed little interest in promoting graphic arts. Many industrial arts instructors lacked graphic arts training.

2701. **KIGER, ROBERT VERNON.** *A Study of the Possibilities of Including Industrial Arts in the Whitney Elementary School, Grades Three Through Eight, Based Upon the Needs and Desires of the Parents and Students in the School Area.* M. S., 1950, North Texas State College. 110 p. Library, North Texas State College, Denton.

Purpose: To poll opinions of the parents and students of the Whitney community concerning the need for industrial arts in the school curriculum.

Source of Data: A survey by questionnaire was completed by 225 students, grades 3 through 8, and 102 parents in the community. The questionnaires sought general information concerning hobbies, leisure time, interests in certain courses, and the desirability of an industrial arts course. An analysis was also made of books in the field and of professional magazines, and of interviews with people in the community.

Findings and Conclusions: Students and parents alike are found to be interested in industrial arts. Accordingly, the following recommendations are made: The Whitney elementary school curriculum be enriched by the addition of craftwork in leather, wood, art metal, plastics; a more extensive course in woodwork be offered later as funds and space are available; an evening course in industrial arts be provided for adults, the material and necessary supplies to be taken care of through a reasonable tuition fee, and the course to be taught by a regular teacher; and that the citizens of the community make an effort to attract and bring industries to the community to provide work opportunities for local people.

2702. **KING, CECIL E.** (M. S.). *The Teaching of Woodworking in Virginia High Schools.* University of Tennessee, 1940. 53 p.

An analytical study of the status of industrial arts woodworking in the State of Virginia for the school year of 1939–1940. The establishment of a uniform skelton course of study in woodworking is proposed.

2703 **KING, THOMAS G.** (M. S.). *Problems of Left-Handed Students in Industrial Arts in Secondary Schools in* *the State of Wisconsin.* The Stout Institute, 1947. 80 p.

A survey of seventy industrial arts teachers in Wisconsin to determine the special problems encountered by left-handed students in drawing, metalworking, printing, woodworking, and crafts in the secondary schools industrial arts shops.

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2704. KJOS, OSCAR E. *Occupational Experience And Success Of Day-Trade Versus General High School Graduates.* Ed. D., 1954, University of Missouri. 159 p. Library, University of Missouri, Columbia.

Purpose: To compare the occupational experiences and success of a group of day-trade school graduates of Greater Kansas City with those of a group of general high school graduates of that area, to see if there were any appreciable differences that could be attributed to their educational backgrounds. A secondary purpose was to obtain and analyze the opinions of the two groups and their employers as to the nature and effectiveness of the training received.

Source of Data: Data were obtained from the records of two general high schools and two day-trade schools, from information forms mailed to 263 general and 163 day-trade graduates, and from the employers of 69 general and 50 day-trade graduates. The two groups of graduates were compared as to: their occupational experiences since graduation from high school, their success in trade and industrial jobs, and their opinions concerning the nature and effectiveness of the industrial courses they had taken.

Findings and Conclusions: Larger percentages of the general high school graduates participated in the professional and the clerical and sales occupational fields. Larger percentages of the day-trade graduates participated in the skilled and the semi-skilled fields. Little difference was found between the two groups in the other major occupational fields. The day-trade graduates excelled in nearly all measures of occupational success used in the study; however, the differences found were relatively small. Employers of the day-trade graduates felt that industrial courses should be broad in nature and applicable to a family of related occupations. Larger percentages of the general high school graduates stated that their shop training was of no specific advantage to them.

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2705. KLEINTJES, PAUL LEO. *Industrial Arts Transportation: The Evaluation, Selection, and Organization of Activities, Problems, and Information on the Secondary School Level.* Ed. D., 1953, The Pennsylvania State University. 211 p. Library, The Pennsylvania State University, University Park.

Purpose: To ascertain those activities, problems and understandings that secondary school industrial arts programs should offer to help youth meet their everyday needs and interests in modern transportation.

Source of Data: Data were obtained by an activity and understanding analysis of transportation made in an industrial arts laboratory situation. These were utilized to construct a questionnaire which was sent to industrial arts teachers, parents and secondary school pupils. Periodicals and transportation equipment owners manuals were examined.

Finding and Conclusions: The activity and understanding analysis of transportation provided a list of "Things a pupil should be able to do" and "Things a pupil should know" which could be used as a content source. The objectives of industrial arts ranged extensively. The following eight seemed to be generally acceptable: exploration, recreation, appreciation, consumer education, guidance, creative expression, social relationships, limited skills. The study indicates that on the bases of activity and understanding analysis, industrial arts objectives, and the needs and interests of pupils a functional program in transportation can be developed. The dissertation supplies the information necessary to implement these bases.

2706. KNAPP, ARTHUR RAYMOND (M. S.). *A Descriptive Survey of the Billings Polytechnic Institute.* Colorado Agricultural & Mechanical College, 1930. 110 p.

A description of the history, location, faculty, business arrangement, buildings, equipment, and industries of the Billings Polytechnic Institute.

2707. KNAUS, LIONEL. *The Shakers: Their Crafts and Industries.* M.A., 1950, Ohio State University. 96 p. Education Library, Ohio State University, Columbus.

Purpose: To afford an understanding of the many social and economic phases of early Shaker life and to show their implications for the present.

Source of Data: Review of literature and visits to libraries and museums at Cleveland, Ohio, and Harrodsburg, Kentucky.

Findings and Conclusions: Shakers engaged in saw milling, carpentry, turnery, coopery, wagon making and furniture construction. Their houshold industries included baking, chair making, brickmaking and leatherwork. Metal working industries included blacksmith, nailsmith and machine shop and the agricultural industries were farming and gardening. The study reveals many possibilities for the area of industrial arts.

2708. KNIGHT, HORACE (M. A.). ***The Status of Industrial Arts in Virginia.*** **Western Kentucky State College, 1948. 50 p.**

A consideration of industrial arts programs and industrial arts teachers in Virginia during the school year 1947–48. It includes the courses and how these offerings are presented, together with the qualifications of the industrial arts teachers.

2709. KNOSS, WAYNE WESLEY. ***Status of Minnesota Industrial Arts Teachers in 1947.*** **M.S., 1949, Iowa State College. 49 p. Library, Iowa State College, Ames.**

Purpose: None reported.

Source of Data: The study included all the industrial arts teachers in the Minnesota secondary schools during the 1947–48 school year with the exception of those teachers in the Minneapolis, St. Paul and Duluth schools.

Findings and Conclusions: None reported.

2710. KOCH, NORBERT H. (M. S.). ***Industrial Arts Needs in Rule High School, Knoxville, Tennessee.*** **University of Tennessee, 1940. 70 p.**

A study of 185 high school boys, in 1939–1940, with consideration given their intelligence, vocational aptitude, occupational background, and occupational preferences. Included are the historical development of the schools, the present industrial arts program, and the results of an industrial arts questionnaire.

2711. KOENIG, JOHN HENRY. ***The Curriculum in Industrial Arts in Michigan High Schools Employing One Shop Instructor.*** **M. A., 1954, Western Michigan College of Education. 52 p. Library, Western Michigan College of Education, Kalamazoo.**

Purpose: To investigate the types of curricula in industrial arts in the high schools of Michigan employing one shop instructor, the arrangements of the courses, and the numbers and types of machines in these shops.

Source of Data: Data were obtained from questionnaires sent to approximately three-fifths of the industrial arts instructors in the schools in the State of Michigan that employed only one shop teacher.

Findings and Conclusions: Few schools offered industrial arts at the seventh grade level. The majority of the schools used a general shop of four or more areas. The most frequently occurring areas were hand woodwork, sheet metal, electricity, plastics, graphic arts, and auto mechanics.

2712. KOON, GEORGE W. ***Occupational Implications Of Industrial Arts In Coffeyville, Kansas.*** **M. S., 1954, Kansas State Teachers College. 56 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To ascertain the occupational implications of an industrial arts curriculum when used for terminal education.

Source of Data: Data were obtained from a questionnaire, school records, and literature.

Findings and Conclusion: The industrial arts student has a definite occupational advantage when compared with people with a similar level of education but not having had industrial arts training.

2713. KORN, CHARLES E. (M. S.). ***Industrial Arts for Girls in Secondary Schools in the Middle West.*** **Iowa State College, 1932. 36 p.**

A description of the nature and extent of industrial arts work offered to 4,446 girls in seventy secondary schools of eight middle-western states during the year 1931–1932. Several other items such as length of class period, size of class, and extent of segregation are included.

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2714. KRUBECK, FLOYD EARL. ***Relation of Units Taken and Marks Earned in High School Subjects to Achievement in the Engineering College.*** **Ed. D., 1954, University of Missouri. 114 p. Library, University of Missouri, Columbia.**

Purpose: To ascertain the relation of the number of units taken and marks earned in high school English, mathematics, science and industrial arts to achievement in the Engineering College of the University of Missouri, and to ascertain the extent to which marks earned in each of these four high school subjects contributes to this achievement.

Source of Data: Data were secured from records of the Director of Admissions; Engineering Dean's Office; Department of Educational Psychology; and Guidance Service of the University of Missouri. Undergraduate records of 429 of the 1103 engineering graduates (1949 to 1953) examined were used. Data from above sources were recorded on a data sheet, punched on IBM cards, and statistically treated.

Findings and Conclusions: The size of the high school graduating class has little effect on whether or not students graduate from the College of Engineering. Marks earned in high school English, mathematics, science, and industrial arts have a direct significant relation to achievement in the College of Engineering, whereas the number of units taken in these subjects has very little relation to engineering achievement. Marks earned in high school mathematics was a better predictor of engineering achievement than marks earned in either English, science, or industrial arts. A higher coefficient of correlation existed between marks earned in the four high school subjects and achievement than between any one of the high school subjects and the criterion. Units taken and marks earned in the four high school subjects account for only 16 per cent of scholasic achievement in the Engineering College.

2715. KUHN, WILBUR J. (M. Ed.). ***The Status of Industrial Arts in the Schools of Pickaway County.*** **Ohio State University, 1942. 132 p.**

A survey of the schools in Pickaway County, Ohio, at the outbreak of World War II. Suggests that a more attractive program would encourage a larger percentage of the boys and girls to elect courses in industrial arts.

2716. KULAWIZ, RUSSELL MYRON. ***The Status of Industrial Arts Shops in The State of Indiana.*** **M. S., 1953, Purdue University. 25 p. Industrial Education Office, Purdue University, Lafayette, Ind.**

Purpose: To obtain information regarding conditions in industrial arts shops in cities of 10,000 population or more in the State of Indiana.

Source of Data: Data were obtained through questionnaires from 50 junior and senior high schools and from available literature.

Findings and Conclusions: Unit shops are more commonly found in larger high schools, general shops in smaller schools. Housing facilities range from good to adequate. The most common types of courses offered, in order, are: wood, drawing, machine metal, graphic arts, electricity, and auto-mechanics. Most of the industrial arts shops were found to be well equipped, with the exception of unit drawing rooms.

2717. KURTZ, HARMON HENRY. ***A Survey of Industrial Arts Courses Offered in the Third Class City and Rural High Schools of Kansas.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1942. 32 p.**

A survey of industrial arts in schools of third class cities and rural communities of Kansas in 1940.

2718. LALLUM, GORDON GERHARD. ***The Status of Industrial Arts Teaching in Montana High Schools with Enrollments of from 40 to 150 Students in 1950.*** **M. Ed., 1952, Montana State University. 70 p. Library, Montana State University, Missoula.**

Purpose: To ascertain the status of industrial arts in secondary schools of Montana.

Source of Data: Data were secured by questionnaire sent to selected principals and instructors.

Findings and Conclusions: Most shops were of multi-unit type, nearly one-half in basements. The one-hour period was the most common. Seven out of twenty-five high schools offered some work for girls. Few visual aids were used. State courses of study were not used. Most of the teachers had majors in industrial arts and standard secondary certificates.

2719. LANE, JAMES SIDNEY (M. S.). ***A Study of Industrial Arts in the State of Washington as Related to Teacher Training.*** **Oregon State College, 1940. 111 p.**

A study of the status and acceptance of industrial arts in the state of Washington.

2720. LANGLOIS, GERARD VICTOR. ***The Teaching of Industrial Arts Woodworking in Tennessee High Schools.*** **M. S., 1950, University of Tennessee. 79 p. Library, University of Tennessee, Knoxville.**

Purpose: To examine industrial arts woodworking courses in Tennessee high schools.

Source of Data: Data were obtained from a questionnaire sent to all high school industrial arts woodworking departments reported in the State Office directory.

Findings and Conclusions: A large majority of the teachers were teaching woodworking exclusively. Most industrial arts students were found enrolled in grades nine and ten. Ninety-five per cent of the woodworking teachers held the Bachelor's degree and eighteen per cent held the Master's degree. Seventy-one per cent received their college training in Tennessee. The median size shop was 2400 square feet. The median salary was $3156.

2721. **LAVINE, DONALD WILLIAM.** *Industrial Arts in the First-Class Schools of Colorado.* M. A., 1953, University of Minnesota. 60 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To ascertain the status of industrial arts instructors in the first-class schools of Colorado, the work they perform, and the programs in which they participate.

Source of Data: Data were obtained from the instructors by means of a questionnaire.

Findings and Conclusions: Findings were recorded on every phase of the industrial arts program in Colorado. The instructors contacted recommended the establishment of a Department of Industrial Education on the state level.

2722. **LAWRENCE, RUFUS NATHANIEL.** *Industrial Arts For the Negro Secondary Schools in North Carolina.* M. A., 1955, The Ohio State University. 104 p. Library, The Ohio State University, Columbus.

Purpose: To investigate the population and occupational changes among Negroes in North Carolina between 1940 and 1950 and to plan a program of industrial arts education for Negroes relative to changes in their economic and social status.

Source of Data: Data were obtained from a study of the United States census data and experiences of the writer.

Findings and Conclusions: Negroes in increasing numbers are seeking industrial opportunities in urban areas to improve their economic condition. Negroes may join trade unions; however, many remain unorganized. Negro teachers constitute the largest professional group. The elementary industrial arts program should center around food, clothing and shelter. The secondary program should offer industrial arts as part of the core curriculum followed by specialized courses.

2723. **LEBEGUE, DUANE, E.** *A Survey of the Mechanical Skills and Knowledges Needed and Possessed by Missionaries Serving Under the Faith Mission Boards.* M. S., 1954, Stout State College. 175 p. Library, Stout State College, Menomonie, Wisconsin.

Purpose: To ascertain which mechanical skills and knowledges are possessed and which are needed by foreign missionaries; what is and what should be, the role of specialist missionaries; and whether there is a need for a technical library service for missionaries.

Source of Data: Data were secured from mission boards and missionaries by the use of questionnaires and from schools training missionary candidates by a survey of their catalogs.

Findings and Conclusions: A majority of missionaries believe that missionary candidates and missionaries on furlough should be given training in mechanical skills. They believe that, although there is some need for specialists, the majority of the need for personnel proficient in various mechanical skills should be met by the regular missionaries. It was found that schools training missionary candidates are doing little to provide technical training which this study indicates is needed.

2724. **LEE, ANDREW LOYS.** *Practice Teaching in Industrial Arts Education in Selected Oklahoma Colleges.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 79 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To isolate, study and evaluate the many features and activities which constitute the student teaching programs in the University of Oklahoma, the Oklahoma Agricultural and Mechanical College, Central State College, Southwestern Institute of Technology in Weatherford, where the writer acts as a critic teacher.

Source of Data: A background study of student teaching, practice teaching or cadet teaching in all teacher education institutions was made. Several yearbooks were studied as were the catalogs and directories concerning student teaching in the 4 schools studied.

Findings and Conclusions: A greater recognition is needed of the importance of frequent and detailed evaluation of the personal and professional characteristics of each student teacher. A renewed realization of the importance of student planning as a preparation for effective teaching is desired. A closer scrutiny should be made of the materials presented as the "theory" part of practice teaching. More frequent and personalized conferences with each practice teacher are desired. An analysis should be made of the responsibilities and obligations of the director or supervisor of student teaching in the teacher education department. Many forms are proposed by the writer to be used by the student teacher in his work, as well as evaluative and rating sheets and scales to be used by critic and supervising teachers.

2725. LEEBL, GEORGE. *Vocational Education in Iowa.* M. A., University of Minnesota, 1940.

A documentary study of the growth of federally-aided vocational education in Iowa, 1917 through 1938.

2726. LEWIS, LAWRENCE LEROY. *Survey of Industrial Arts in Negro High Schools in the State of Missouri.* M. S. in Ind. Ed., Kansas State Teachers College, 1948. 96 p.

An account of industrial arts programs in the Negro high schools in Missouri as of 1948.

2727. LEWIS, VERNON G. (M. A.). *Printing Opportunities for Negroes in the United States.* Ohio State University, 1938. 68 p.

A consideration of the fundamental economic and social problems confronting the Negro approaching industry. Employment possibilities, training opportunities, and requirements for admission to the printing trade are included.

2728. LEWIS, VOLTA SHARRAI (M. S.). *A Study of the Teaching of Mechanical Drafting in Junior and Senior High Schools in Tennessee.* University of Tennessee, 1931. 207 p.

A study, based on data from sixty-nine high schools, to determine the total number and kinds of drafting courses being taught and to ascertain whether each course is taught as a separate subject or as a part of some other shop course for the school year 1930–1931.

2729. LIETZ, GILBERT N. *The Status Of The Industrial Arts Teacher in Kansas, 1953.* M. S., 1953, Kansas State Teachers College. 82 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the professional training, salaries, turnover, trade experience, teaching load, subjects taught, extra-class activities, summer activities, major and minor field of study in college and the number and location of the industrial arts teachers in the state.

Source of Data: Data were obtained through questionnaires sent to 680 industrial arts teachers.

Findings and Conclusions: The findings are recorded under the following headings: personal, scholastic, teaching, and inter-related data. A "picture" is given of the typical industrial arts teacher in Kansas.

2730. LINDBECK, JOHN ROBERT. *The Industrial Arts Program at Breck School, St. Paul, Minnesota.* M. A., 1955, University of Minnesota. 60 p. Industrial Education Department, University of Minnesota, Minneapolis.

Purpose: To present an account of the thought and planning behind the establishment of the industrial arts program at Breck School.

Source of Data: Data were obtained from records concerning the establishment of the program.

Findings and Conclusions: Suggestions for the expansion and improvement of the physical plant are offered. Curriculum offerings are described and plans for improvements were set forth.

2731. LINDBLOOM, DELLMONT R. *A Study of the Industrial Arts Program in Wisconsin City Elementary Schools.* M. S., 1951, Stout State College. 100 p. Library, Stout State College, Menomonie, Wis.

Purpose: To compile information on the number, content and trend of expansion of the industrial arts programs in the city elementary school of Wisconsin.

Source of Data: A post card was sent to 119 Wisconsin cities to locate those having elementary school industrial arts. Questionnaires were sent to schools reporting industrial arts offerings.

Findings and Conclusions: Returns from 82 cities indicated that 20 cities had a total of 56 instructors teaching industrial arts to elementary pupils. Industrial arts should be taught as an integrated part of other subjects in the lower grades and as a special subject in the upper grades. Industrial arts should be offered on more grade levels and in more cities.

2732. LINDSTROM, OSCAR H. (M. S.). *Analysis of Tenure and Salaries of Minnesota Industrial Arts Teachers 1931–1946.* Iowa State College, 1947. 46 p.

An analysis of the salaries paid to industrial education teachers in Minnesota from 1931 to 1946. Teacher tenure for the various sized communities and the salary-tenure relationship are also discussed.

2733. LIVINGSTON, EVERETT G. (M. S.). *A study of the Preparation, Salaries, Interests, and Factors Related to the Work of Industrial Arts Teachers in the State of Kansas.* Iowa State College, 1930. 90 p.

A study on the preparation salaries, tenure, motives, interests, and teaching conditions of 301 industrial arts teachers in Kansas.

2734. LOPEZ, LAWRENCE. *A Critical Analysis of the Educational Program of the Lorenzo de Zavala Elementary School and of the Northside Junior High School of Corpus Christi, Texas, to Determine Whether Industrial Arts is Needed and Wanted.* M. S., 1951, North Texas State College. 138 p. Library, North Texas State College, Denton.

Purpose: To ascertain whether industrial arts was needed and wanted in a designated elementary and junior high school in Corpus Christi, Texas.

Source of Data: Data were secured from the children, their parents and the teachers in the two schools.

Findings and Conclusions: Students indicated an intense interest in industrial arts. The teachers in the two schools were of the opinion that by adding industrial arts and some other courses of a laboratory nature the high rate of pupil drop-out would be decreased.

2735. LUCAS, D. JOHN. *Is Industrial Arts Benefiting a Representative Population of Kalamazoo Central High School Boys?* M. A., 1950, University of Michigan. 84 p. Educational Library, University of Michigan, Ann Arbor.

Purpose: To determine if it is possible on the basis of various measurements to differentiate groups of boys electing industrial arts, including four or more units of work, from those who did not elect it as a school curriculum.

Source of Data: The individual records in the Kalamazoo Central School files were used to obtain information, which (information) was examined in terms of such variables as chronological age, personality traits, intelligence, socio-economic status, etc.

Findings and Conclusions: Those electing industrial arts made up less than one-third of the total high school population of boys, and they are not representative of a true cross section of all boys in the school. In terms of the variables used, the group who elects industrial arts compares with the other group as follows: They are on the average, six months older than those not electing industrial arts. Their intelligence range is narrow and average intelligence is considerably lower. Their academic achievement is not only below that of the other group, but also below that which their intelligence would lead one to expect. Their backgrounds are more often those of the lower economic strata. They are planning for an occupation requiring only average or inferior intelligence. They come from comparatively large families. They are rated for the most part as average or low in personality characteristics. In view of the fact that the program is not benefiting a representative cross-section of Central High boys, the author seeks to argue for the contribution of industrial arts to the general education as a justification for encouraging more boys to take such a program. He makes specific recommendations based upon his study and the above arguments.

2736. LUETZOW, ROBERT EDWARD. *Industrial Arts in the Affiliated and Parochial Schools of Ohio.* M. A., 1950, Ohio State University. 71 p. Education Library, Ohio State University, Columbus.

Purpose: To determine the extent of industrial arts offerings in the affiliated private and parochial secondary schools of Ohio; to appraise the qualifications of teachers and to survey the projected plans of these schools concerning industrial arts programs.

Source of Data: A survey of 91 schools with male pupil enrollments in grades 9 through 12 during 1949–1950 school year.

Findings and Conclusions: Over half of the schools listed industrial arts courses; 57 per cent of the schools enrolled 76 per cent of the total male enrollment, 22 per cent of the students in schools having industrial arts enrolled in the various courses enroll over half of all boys taking industrial arts; no other area enrolled more than 7 per cent; thirty of the 52 schools listed one area of work; less than one-half of the instructors were considered qualified to teach and the trend indicates a desire for more industrial arts in the schools.

2737. LUSHINE, JAMES A. *Minnesota's Industrial Arts Program in 1945–1946.* M. A., University of Minnesota, 1947. 44 p.

A canvass of secondary school offerings, enrollments, instructional programs, schedules, loads, salaries, and other items of detail for Minnesota for 1945–1946.

2738. LYLE, FRED DEAKINS, *Jr. Trade and Industrial Training for Veterans Conducted by Public School Authorities in Tennessee.* M. S., 1952, University of Tennessee. 70 p. Library, University of Tennessee, Knoxville.

Purpose: To review the trade and industrial training programs for veterans conducted by the public schools of Tennessee.

Source of Data: Data were secured through questionnaires, visitation, and personal conferences with administrators.

Findings and Conclusions: The nine programs offered training in 25 different occupational fields. A total of 8,460 white and 5,485 Negro veterans were enrolled. Largest enrollment was in auto mechanics, with radio repair and maintenance second, and woodwork third. The percentage of students completing courses was relatively low. The program with the largest percentage of placement was machine shop.

2739. MALLOY, CHARLES P. (Masters). *A Study of the Final Grades of 10A Industrial Students in Automechanics in the Northeast High School for the Purpose of Comparing the Achievements of those Boys who Entered High Schools from Junior High Schools with Those Boys Who Entered from Grade 8.* University of Pennsylvania, c. 1935–47.

2740. MANN, GEORGE (M. S.) *A Study of the Present Status of Industrial Arts in Central Rural Schools of New York State.* Syracuse University, 1935. 100 p.

An investigation of the experience, salaries, training, and duties of industrial arts teachers in rural schools. A study of the class procedures and architectural features of these schools is included.

2741. MARION, GLENN EDWIN (M. S.). *A Survey of Industrial Arts in the Larger Senior High Schools of Missouri.* Oregon State College, 1941. 75 p.

The study covers such aspects as teacher preparation, experience, tenure, program content, methods, time schedule, type of shop, and terminological designation of the industrial arts program.

2742. MARTIN, CHESTER W. (M. A.). *Survey of Organization of Material Resources and Content of Instruction in Industrial Arts in Junior and Senior High Schools of Harrison County, West Virginia.* West Virginia University, 1942. 34 p.

A survey of the local schools in an effort to determine the status of course content, teacher qualifications, and of available resources. Suggestions are made regarding the purchasing of industrial arts supplies.

2743. MATTHEWS, CLAUDE E. *State Courses in the Industrial Arts.* M. A., University of Minnesota, 1940. 52 p.

An analytical survey and analysis of the content, arrangement, and mechanical features of State sylabi or courses of study in industrial arts, with suggestions for an improved outline.

2744. MATTHEWS, FRANCIS NEWTON (M. A.). *The Status of Industrial Arts in Mississippi.* Western Kentucky State College, 1948. 38 p.

A study to discover the number and kinds of schools teaching industrial arts. The number of teachers, white and colored, their experience and scholastic preparation, and salary were considered.

2745. MATT, HAROLD DEWITT (Masters), *A Survey of the Industrial Arts Libraries in Junior and Senior High Schools with an Enrollment of 200 or over Located in the Eastern Half of Iowa.* Iowa State College, 1932.

2746. MAXWELL, JOHN B. (Masters). *Industrial Arts in the Dayton, Ohio Public Schools.* Ohio State University, 1940.

2747. MAY, STANLEY W. (M. A.). *The Status of Industrial Arts Education in Oklahoma.* Colorado State College of Education, 1935. 93 p.

A personnel study of the industrial arts teachers of Oklahoma as determined by professional education, major and minor, trade experience, teaching experience, size of school, salary, and subjects taught.

2748. **McCARY, HENRY WILLIAM.** *The Status of Industrial Arts in Negro Schools of Oklahoma and Suggestions for Improvement.* M.S., 1952, Kansas State Teachers College. 92 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the status and trends in industrial arts in the Negro high schools of Oklahoma.

Source of Data: Data were obtained from a questionnaire and literature.

Findings and Conclusions: Industrial arts was offered in 39 accredited Negro high schools in the state. Woodworking and drawing were the most frequent courses. Sixteen instructors listed school maintenance as a part of their assigned work. Thirty-two instructors had Bachelor degrees in Industrial Education, and six had Masters degrees.

2749. **McCULLEY, GEORGE DONALD** (M. S.). *A Survey of Industrial Arts Teaching in McDowell County, West Virginia.* University of Tennessee, 1939. 73 p.

A comparative study, based on questionnaire responses and school records of industrial arts teaching in McDowell County, West Virginia. It includes such topics as industrial arts courses offered, enrollments, methods of teaching related information, and time devoted to shop.

2750. **McDANEL, WILLIAM R.** *Industrial Arts for the East Baton Rouge Schools.* M. S., 1950, Louisiana State University. 111 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine the need for industrial arts in the schools of East Baton Rouge Parish. To develop a total program of industrial arts to meet the demands of these schools.

Source of Data: Questionnaires were delivered personally to 23 white public elementary, junior and senior high schools in East Baton Rouge Parish. Personal interviews were conducted with each principal and the information secured was used to supplement the questionnaires. A second set of questionnaires was sent to the supervisors of industrial arts in 30 cities of 100,000 population, as a means of determining the status of industrial arts in other cities the size of Baton Rouge.

Findings and Conclusions: Only 2 schools of the 23 visited were offering industrial arts in the curriculum. The principal reasons given for not offering industrial arts in the schools in order of frequency were: No shop facilities, lack of funds, and teachers unavailable. Only 2 of the schools visited had previously taught industrial arts. Sufficient time could be devoted to industrial arts if it were decided to include industrial arts in the respective schools. The services of a full-time industrial arts teacher could be shared by centrally located schools with a small enrollment.

2751. **McFARLAND, KENNETH LEE** (M. A.). *Industrial Arts in Clinton County, Ohio—A Study of the Nature and Projection of Industrial Arts in the Schools of Clinton County, Ohio.* Ohio State University, 1943. 81 p.

A description of how an industrial arts program is conducted. It includes information on curriculum development and how the county industrial arts program serves the communities. Organizational and administrative problems are discussed.

2752. **McFARLAND, LUCILE L.** (Masters). *Vocations and Vocational Training Programs in Palo Alto, California.* Stanford University, 1945.

2753. **McGOVERN, PHILIP C.** *School Shops in an Oregon County.* M. A., University of Minnesota, 1940. 100 p.

An analytical study of 8 industrial arts departments in Klamath County, Ore., with suggestions for the conversion or reorganization of 2 shops and improvements of the others.

2754. **McGUIRE, ERNEST J.** (M. A.). *Opportunities Offered for Vocational Training in Institutions in Tennessee.* George Peabody College, 1932. 156 p.

A study which includes a list of seventy-nine educational agencies in Tennessee that offer opportunities for vocational training.

2755. **McKISSACK, PAUL W.** (M. A.). *Junior High School Industrial Arts in Missouri.* Colorado State College of Education, 1933. 189 p.

A study of industrial arts offerings of the junior high schools of Missouri.

2756. **MC KNIGHT, HOWARD W.** *Value of High School Subjects as Rated by Former Pupils.* M. S., 1950, Iowa State College. 133 p. Library, Iowa State College, Ames.

Purpose: To obtain the opinions of former pupils concerning the value of subjects taken in high school.

Source of Data: Data were collected from questionnaires sent to graduates of Wilson High School, Cedar Rapids, Iowa, who had taken two or more years of industrial arts during the periods 1935–1941 and 1945–1948.

Findings and Conclusions: The most favored response in all areas was "much value" when evaluating the courses taken.

2757. **MEACHEN, JAMES H.** (M. S.). *Preparation and Duties of North Dakota Industrial Arts Teachers.* Iowa State College, 1946. 72 p.

A study of the industrial arts teachers employed in the secondary schools of North Dakota during 1945–1946. Comparisons on such topics as education, salaries, size or town, and school enrollment are made.

2758. **MEANS, OTHO W.** *Educational Status of Trade and Industrial Instructors of Nebraska.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 48 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain what training deficiencies exist in the qualifications of the trade and industrial instructors of Nebraska.

Source of Data: Data were secured through questionnaires sent to trade and industrial education instructors in Nebraska.

Findings and Conclusions: All of the trade and industrial instructors meet the requirements of the Nebraska State Plan for Vocational Education. Most of them have continued to advance in both the trade and professional fields after leaving industry and entering the teaching profession.

2759. **MEDLEY, FRANK W.** (M. S.). *Industrial Arts in the Junior High Schools of Texas.* A & M College of Texas, 1935. 51 p.

A study of the different types of industrial arts programs in operation and the need for further development. Types of courses are suggested.

2760. **MENKE, HATTIE A.** (M. A.). *The Improvement of Industrial Arts Education in Wyoming.* Colorado State College of Education, 1938. 71 p.

A survey showing the status of the teacher of industrial arts in Wyoming and why industrial arts is not offered in some schools, with the view of making recommendations for improvement.

2761. **MICHAEL, ROY A.** (M. A.). *Trade and Industrial Education in Western Missouri.* Colorado State College of Education, 1932. 91 p.

An investigation of the trade schools of Western Missouri, with emphasis on what trades are taught, teacher preparation, and cost of such trade school programs.

2762 **MILBURN, JAMES L.** (M. S.). *A Survey of Industrial Arts Printing in the United States.* Indiana State Teachers College, 1937. 50 p.

An attempt to discover the nature and extent of junior high school printing in the United States. Consideration is given to the preparation of the teacher, the related subjects he teaches, and the textbooks that are used.

2763. **MILLER, STANLEY L.** *The Professional Preparation of Industrial Arts Instructors in the Northern Sacramento Valley.* M. A., 1952, Chico State College. 48 p. Library, Chico State College, Chico, Calif.

Purpose: To ascertain the professional preparation of the industrial arts instructors in the Northern Sacramento Valley.

Source of Data: Data were secured through questionnaires distributed to industrial arts instructors.

Findings and Conclusions: Ninety per cent of the industrial arts instructors included in the study held Bachelor's degrees while eighteen percent held the Master's degree. Approximately half majored in industrial arts, one-fourth minored in industrial arts, and one-fourth had no industrial arts training. All but one of the industrial arts instructors studied had some trade experience. There was a definite lack of interest in joining professional organizations.

2764. **MILLS, RALPH R.** (M. A.). *Industrial Arts Opportunities in Fifty Rural and Village Schools in Southwestern Ohio as Shown by the Weber Score Card.* Miami University, Ohio, 1938. 49 p.

An attempt to determine the opportunities for improving and extending the industrial arts program in fifty villages and rural communities in Ohio. The industrial arts programs were evaluated by the Weber score card and thus the areas in which improvement could be made were noted, 1937–38 period.

2765. MITCHELL, WILLIAM R. *The Teaching of Industrial Arts in Arizona.* M. S., 1951, Stout State College. 133 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the status of industrial arts in the secondary schools of Arizona.

Source of Data: Data were obtained from a questionnaire sent to 66 of the 139 industrial arts teachers in the state, two-thirds of these being located in Pima and Maricopa counties.

Findings and Conclusions: Enrollment in the secondary schools of Arizona ranges from 120 to 3104 students. Most schools are organized on the 8-4 plan. Industrial arts is elective on the senior high school level and generally required in the seventh and eighth grades. Two-thirds of the teachers report teaching five or more periods (60-65 minutes each) per day to classes ranging from 10 to 25 students.

2766. MONETT, PAUL E. (M. A.). *Industrial Arts in the Rural High Schools of Ashtabula County.* Ohio State University, 1938. 75 p.

A survey of the nature and extent of industrial arts in the rural high schools of Ashtabula County, Ohio, for 1938 in an effort to compare the conditions with the standards set by the State of Ohio.

2767. MONTAGUE, CHARLES ADAM (Masters). *A Survey of Industrial Arts in the Accredited High Schools of North Dakota.* University of North Dakota, 1939.

2768. MOORE, JOHN MAX. *A Survey on Color Dynamics in the Industrial Arts Shops of The Public Secondary Schools in Kentucky.* M. Ed., 1954, University of Louisville. 70 p. Library, University of Louisville, Louisville, Ky.

Purpose: To ascertain the extent to which color dynamics was being employed in the industrial arts shops in the public secondary schools of Kentucky.

Source of Data: Data were secured by use of a questionnaire.

Findings and Conclusions: There is an increasing trend toward the use of color dynamics in industrial arts shops.

2769. MOORE, LEONARD A. (M. S.). *An Evaluation of Certain High School Subject-Matter Groups in Terms of Their Contributions to the Seven Objectives of Secondary Education.* Oregon State College, 1933. 81 p.

A survey among 748 experienced teachers, rating all subjects against their possible contribution to the stated general objectives of secondary education.

2770. MOTT, HUBERT LESLIE (Masters). *Survey of Vocational-Industrial Education in Seneca Falls, N. Y.* Cornell University, 1933. 115 p.

2771. MOUTOUX, ALFRED CARL (M. A.). *The Status of Industrial Arts Electricity in Indiana.* Indiana University, 1941. 127 p.

Questionnaires were sent to 535 full-time industrial arts instructors, 298 part-time industrial arts instructors, and 21 public school administrative officers in industrial education to determine what has been done to promote electricity in industrial arts areas in Indiana. The study was made during 1940-1941.

2772. NEAT, CLAUDE A. (M. S.). *Industrial Work in the Indian Schools of Oklahoma.* Oklahoma A. & M. College, 1936. 77 p.

A survey of the industrial education programs in the Indian schools of Oklahoma, with recommendations for their improvement.

2773. NEE, WILLIAM JOE (M. S.). *A Survey of Industrial Arts in the Public Schools of Oregon.* Oregon State College, 1940. 65 p.

A survey of the areas being taught and the preparation of the teachers offering the subjects.

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2774. NEFF, WILLIAM L. (Doctors). *A Study of Federally Reimbursed Vocational Education in the State of North Dakota.* Stanford University, 1941.

2775. NELSON, A. FRANK (M. S.). *To Determine the Relation of Mechanical Drawing Taught in the Junior High Schools of North Texas with Other Subjects Taught and Propose an Outline that Will Have a High Relationship.* North Texas State College, 1947.

Investigates status of mechanical drawing and its relationship to other subjects taught in a group of junior high schools of North Texas in 1946–1947. A course of study is proposed for general mechanical drawing closely correlated with other courses in the junior high school.

2776. NELSON, WILLIAM B. (M. S.). *A Survey of Industrial Arts for Negroes in the Rural High Schools of Mississippi.* Iowa State College, 1934. 56 p.

A study to ascertain the present status of industrial arts in the rural high schools for Negroes in Mississippi, the extent to which the subject is taught, value of the equipment, number of boys enrolled in the work, and the number who might be interested in the work in each county and in the state as a whole.

2777. NININGER, ROY D. (Masters). *A Survey of the Educational and Personal Qualifications of Beginning Employees in the Roanoke Area.* University of Virginia, 1943.

2778. NOREEN, HOWARD G. *Industrial Arts Course Offerings in 106 Selected High Schools in Cities Within the Population Range of 30,000 to 100,000.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 60 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To identify the industrial arts and vocational course offerings in selected high schools, and to ascertain the usefulness of high school handbooks.

Source of Data: Data were obtained from school handbooks submitted by the schools studied.

Findings and Conclusions: Industrial arts course offerings are listed in more than 80 per cent of these high school handbooks.

2779. OLMSTEAD, SARAH JENKINS. *Vocational Survey of Youth Between the Ages of 16 and 25 in Ann Arbor, Michigan.* M. S. in Ed., University of Michigan, 1940. 164 p.

A survey of 4,156 youth between the ages of 16 and 25 to aid in the establishment of vocational courses and guidance in the schools and the inauguration of new industries in the city. The findings emphasize the need for additional vocational training, new occupational and recreational facilities, and for social adjustment of many of the youth.

2780. O'LOUGHLIN, MALCOLM (M. A.). *A Study of the Vocational and Prevocational Content in the Curricula of the Catholic Secondary Schools in States East of the Mississippi River, Excluding the New England and Middle Atlantic States.* Catholic University of America, 1947. 52 p.

An examination of the courses of study in 838 Catholic secondary schools to determine course content. Recommendations for changes in the curricula are made to meet more adequately the needs of the youth of the area concerned.

2781. O'NEIL, VERNER C. (Masters). *Survey of Informational Content in Senior High School Industrial Arts Courses.* University of Wisconsin, 1933.

2782. ORNSTEIN, EDITH (Masters). *A Study of the Industrial Arts Education and Vocational Industrial Education Offerings in the Philadelphia Schools and a Consideration of the Extent to Which They can Be Organized to Serve the Needs of the Low Intelligence Group.* University of Pennsylvania, c. 1935–47.

2783. PACE, CARL (M. A.) *Status of Industrial Arts in Tennessee.* George Peabody College, 1933. 69 p.

A study of the number and kinds of schools offering industrial arts and such other items as course offerings, training, experience, and salaries of industrial arts teachers to determine the relative position of industrial arts in Tennessee.

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2784. PAGE, CHARLES BRADLEY. *Facilities Required to Meet Future Demands for Industrial Arts Teachers in California.* Ed. D., 1953, Colorado State College of Education. 218 p. Library, Colorado State College of Education, Greeley.

Purpose: To provide data concerning the adequacy of present and planned facilities in order that the California State Department of Education may plan and provide further facilities for the preparation of industrial arts teachers.

Source of Data: Data were secured through a questionnaire from California school directories, projections of secondary school population, the School Planning Office of the State Department of Education, and from the Registrars of four institutions of higher learning.

Findings and Conclusions: Present and planned facilities for preparing industrial arts teachers in California are adequate to supply the maximum number of industrial arts teachers needed through the peak years to 1965–1966, providing the average attendance of new teachers does not exceed 2.3 years at the state institutions which prepare industrial arts teachers for the special secondary credential, no less than 16 per cent of the new industrial arts teachers come from other states, and a maximum of 24 full time equivalents per laboratory is a feasible rate of utilization of facilities. A continued and intensified program of recruitment of capable industrial arts majors at Chico, Fresno, Santa Barbara, and San Jose will be necessary to enable these schools to supply the numbers of industrial arts teachers needed in the immediate future.

2785. PAIGE, JAMES I. *Personal and Professional Data Concerning American Industrial Arts Teacher Education.* M. Ed., 1951, University of Florida. 97 p. Library, University of Florida, Gainesville.

Purpose: To compile information on industrial arts teacher educators for use in a yearbook.

Source of Data: Data were secured by a questionnaire, letters, conferences, and selected texts.

Findings and Conclusions: The "average" industrial arts teacher was approximately 42 years of age, married and has two children. He holds a Master's degree, has 7.4 years public school teaching experience and 9.8 years of industrial arts teacher education experience.

2786. PALMER, HAROLD G. (Masters). *A Survey of the Teaching of Mechanical Drawing in Iowa High Schools.* Iowa State University, 1932.

2787. PAPATOLA, JOSEPH P. *Vocational Trade and Industrial Education in Minnesota.* M. A., 1951, University of Minnesota. 89 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To record the progress and major developments of federally aided vocational trade and industrial education in the State of Minnesota from the passage of the Smith-Hughes Act in 1917 to 1950.

Source of Data: Data were obtained from the annual reports of the United States Office of Education, and the State Department of Education.

Findings and Conclusions: Trade and industrial education in Minnesota has advanced satisfactorily since the passage of the Smith-Hughes Act in 1917. The entire program developed rapidly during the depression years and a decline was noted during the second world war. Great strides have been made in teacher training.

2788. PARSONS, LeROY B. *Preparation and Duties of Iowa Industrial Arts Teachers.* M. S., 1950, Iowa State College. 52 p. Library, Iowa State College, Ames.

Purpose: To collect the data on the preparation and duties of the 716 industrial arts teachers listed in the Iowa Education Directory and to compare these data with data secured in 1940 by B. F. Wievel and in 1944 by J. C. Buchanan.

Findings and Conclusions: Fewer industrial arts majors who had been teaching industrial arts were engaged in administrative work. Forty-six percent of the Iowa industrial arts instructors had received their bachelor's degrees in the past nine years. Almost 88 percent of the teachers with neither a major or a minor in industrial arts had taught in schools with an enrollment of less than 200. The large decreases in the percentage of Iowa industrial arts instructors with no graduate work is probably due to the fact that these teachers had recently graduated from college and had no chance to attend graduate college.

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1789. PAWELEK, ALAN R. *Air Age Education.* Ph. D., 1950, University of Minnesota. 383 p. Library, University of Minnesota, Minneapolis.

Purpose: To ascertain the nation's offerings and activities in Air-Age instruction of general education import, with particular reference to the preparation and upgrading of teachers.

Source of Data: Data were obtained from letters sent to selected agencies and individuals, review of literature, experimental college class of 12 weeks duration, planned, taught and evaluated, and an inquiry form sent to "jury of specialists."

Findings and Conclusions: Educators at all levels are interested in aviation education. The government, industries, and state departments of education are active in publishing

Air-Age education materials. State and federal agencies are beginning to assume leadership in making major educational changes. Success in an aviation course is not significantly correlated with achievement on psychological and reading examinations. Aviation education can best be presented to teachers through workshops.

2790. PEARCE, WILLIAM MILES, JR. *Industrial Arts Teacher Supply and Demand in Louisiana.* M. S., 1949, Louisiana State University. 151 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine the relationship of supply and demand for industrial arts teachers in Louisiana. To make a quantitative study of the supply of industrial arts teachers who are newly trained. To make a qualitative study of the total supply of industrial arts teachers employed in the white public schools of the State.

Source of Data: Questionnaires were sent to the 94 industrial arts teachers whose names were obtained from the State supervisor. Forty of 42.5 percent of the teachers responded to the initial mailing of the questionnaire. A follow-up letter and duplicate questionnaire brought in 19 additional replies making a total of 59 or 62.8 percent returns on the survey to industrial arts teachers.

Findings and conclusions: An undersupply of Louisiana trained industrial arts teachers existed for the year 1948–49 relative to the number of industrial arts graduates available from the year ending August 31, 1948, and to the demand indicated in the parishes. Needs for industrial arts teachers varied in different industrial arts areas. Ceramics, graphic arts, general shop, and mechanical drawing showed deficiencies. The non-degree industrial arts teachers were improving their professional standing by working toward the bachelor's degree. A high percentage of the newly appointed industrial arts teachers majored in industrial arts in college.

2791. PEARCE, WILLIAM MILES (M. S.). *Course Content and Emphasis of Mechanical Drawing in Secondary Schools.* Louisiana State University, 1939. 57 p.

A study of the content of and emphasis on mechanical drawing in industrial education courses in cities over 200,000.

2792. PEASE, EVERETT G. (Masters). *An Analysis of the Training and Experience of 98 Industrial Arts Leaders.* Iowa State College, 1932.

2793. PECK, GLADYS (Masters). *A Study of the Student Personnel in the T. H. Harris Trade School.* Louisiana State University, 1943.

2794. PHARES, GAIL J. *Federal Educational Agencies in Northern California—A Study to Determine Job Opportunities for Industrial Arts Graduates with Teaching Credentials From California State College.* M. A., 1952, Chico State College. 68 p. Library, Chico State College, Chico, Calif.

Purpose: To ascertain the types of training programs, the number, sex, and age of students, the credentials of instructors and supervisors, the salary ranges, and curriculum offerings in certain schools and training establishments under the control of the Federal Government.

Source of Data: Information was obtained by personal interview with the head supervisor of the training program using an interview schedule.

Findings and Conclusions: The majority of the supervisors interviewed stated that industrial arts provided the best background of college training for their instructors. Psychology and general education followed in that order. Instructors needed further training in teaching methods and techniques.

2795. PHELPS, ROBERT (M. S.). *Model Aircraft Construction as an Industrial Arts Subject.* Oklahoma A & M College, 1943. 141 p.

A study of the present interest in model aviation and how model aircraft construction would fit into an industrial arts program.

2796. PICKERING, JOHN D. *A Survey of the Incorporated Schools of Alaska and Selected Alaska Native Service Schools with Special Emphasis on the Industrial Education Program.* M. A., 1953, Chico State College. 68 p. Library, Chico State College, Chico, Calif.

Purpose: To provide a source of reference for industrial arts teachers considering employment in Alaska.

Source of Data: Data were secured by a questionnaire which was sent to the schools within incorporated cities and selected schools administered by the Alaska Native Service.

Findings and Conclusions: Twenty-three of the thirty schools surveyed offered some type of industrial arts or vocational-industrial training. In general, the offerings were limited. Most of the industrial arts instructors taught in other subject fields.

2797. PINTZ, V. C. (M. S.). *Organization of an Industrial Arts Course for a Wisconsin Rural High School.* The Stout Institute, 1941. 40 p.

An analysis of a questionnaire survey of twenty-seven Wisconsin rural school industrial arts teachers to determine the present course content. Those courses receiving the greatest emphasis are compared with the ones the instructors list as most beneficial.

2798. PLATTS, JOHN M. (M. A.). *Industrial Education Survey of Fresno, Calif., 1926, and the Results Three Years Later.* Stanford University, 1930. 89 p.

A survey of an industrial arts program with recommendations of correlation with vocational education agencies. Follow-up study after three years of progress is included.

2799. POWERS, HOMER WILLARD (Masters). *The Offering in Public Trade, Vocational, and Technical Schools of Secondary Grade.* University of Chicago, 1934.

2800. PRIEST, JAY M. (M. A.). *The Offering and Scheduling of Industrial Arts Courses in Junior High Schools.* University of Pittsburgh, 1936. 58 p.

A study to determine practices in regard to industrial arts courses in junior high schools.

2801. PRINE, VIRGIL H. *Industrial Arts Policies in Illinois High Schools with Enrollment of 100 to 1800.* M. S., 1950, Iowa State College. 78 p. Library, Iowa State College, Ames.

Purpose: To contrast the policies followed in both large and small schools by industrial arts teachers of Illinois.

Source of Data: Data were secured from 182 check lists returned by Illinois shop teachers.

Findings and Conclusions: The unit shop was used by 26.5 per cent of small schools and 52.5 per cent of the large schools. Over 34 per cent of the respondents used 60 minute classes, the highest percentage being in the large schools.

2802. PUEHLER, STANTON H. (M. S.). *Tenure and Salaries of Industrial Arts Teachers in the State of Wisconsin from 1926 to 1936.* Iowa State College, 1937. 54 p.

A study of salaries and tenure of industrial arts teachers and the effect of additional training beyond the minimum requirements upon salaries covering a ten-year period which included the depression years.

2803. QUIRING, PAUL D. *Industrial Arts Libraries in Kansas High Schools.* M. S., 1951, Kansas State Teachers College. 61 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To find out the industrial arts library conditions in Kansas high schools and to ascertain where industrial arts books are kept in the school.

Source of Data: Data were obtained from questionnaires sent to principals or superintendents of high schools in the State of Kansas.

Findings and Conclusions: Industrial arts books comprise too small a percentage of the total number of books available to students. Too little money is allocated and spent for books in this area. Libraries containing projection materials were few and scattered. Too many old and unused books made up the total of books available.

2804. RACHEL, ANTHONY M. *Jr. The Place of Industrial Arts in Catholic Schools: Some Opinions of Catholic Educators.* M. Ed., 1953, Wayne University. 23 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To find out why industrial arts, generally, is not included in the curriculum of Catholic schools, and if it were included, what its place would be in the curriculum.

Source of Data: Data were obtained from interviews and by questionnaires sent to the superintendents of Catholic schools in the twenty-four Archdioceses in the United States. The study also included a search of dissertations, theses, professional magazines, and other publications.

Findings and Conclusions: Industrial arts is not included in the curriculum of Catholic schools because of the cost of equipping and maintaining the program. If the economic factor were removed, industrial arts would be added to the curriculum. Although many Catholic schools do offer drafting, the superintendents, generally, do not think that it is sufficient to accomplish the objectives of industrial arts.

2805. **RAY, CLIFTON D.** *A Study of Industrial Arts in Rural Middle Tennessee.* M. A. 1955, Middle Tennessee State College. 57 p. Library, Middle Tennessee State College, Murfreesboro.

Purpose: To ascertain the status of industrial arts in the rural schools of middle Tennessee.

Source of Data: Data were obtained from the Tennessee State Department of Education, reports of high school principals and superintendents, and a questionnaire sent to industrial arts teachers in the area.

Findings and Conclusions: Industrial arts is offered in only one-fourth of the Middle Tennessee high schools studied. Woodwork is offered more than any other area. Less than half of the industrial arts instructors taught full time in their field. No uniform method of securing supplies or financing the shops was apparent. All but one of the teachers were educated in Tennessee. Teacher turnover is low.

2806. **READLY, CLAUDE H.** (M.S.). *A Survey of the Teaching of Trades and Skills Related to Electricity in Pennsylvania Vocational Schools.* Pennsylvania State College, 1948. 75 p.

An evaluation of the opinions of electrical contractors, electrical shop instructors of all-day vocational school programs, and personnel men in industry regarding related trade activities to determine to what extent industrial practices paralleled those of schools.

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2807. **REED, HOWARD ODIN** (Ed. D.). *Evaluation of Industrial Arts in Secondary Schools of Illinois.* University of Illinois, 1948. 256 p.

A survey of the methods and devices used and the facilities for effective shop and drawing instruction in fifty schools in Illinois.

2808. **REED, SAMUEL PAYNE** (M. A.) *Place of Aviation Instruction in Modern Junior and Senior High School Curricula.* Stanford University, 1938. 88 p.

A survey of school programs in aviation from 1929 to 1938. Recommendations for future programs are offered.

2809. **REEVES, ROBERT E.** (M. S.). *Teaching Design in the Industrial Arts Shops of Iowa.* Iowa State College, 1947. 46 p.

An investigation of the extent to which industrial arts teachers in Iowa public schools teach the following phases of design: (1) function, (2) suitability of materials, (3) processes used in construction, (4) appearance.

2810. **ST. GEORGE, R. EDWARD** (Masters). *An Analysis of the Filling Station Business. Special Regard to the Operator's Duties and Responsibilities with Recommendations for Training.* University of Alabama, 1940. 120 p.

2811. **REYNOLDS, MARSHALL L.** (M. S.). *Provisions For Teaching Industrial Arts in Five Counties in Central Iowa.* Iowa State College, 1949. 62 p.

A survey to examine the present industrial arts programs of the high schools in Greene, Dallas, Boone, Guthrie, and Story counties of Iowa regarding (1) physical aspects of shop, (2) curriculum with reference to subjects offered, and (3) educational qualifications of instructors.

2812. **RILEY, CHESTER E.** (M. A.). *A Survey of Content and Method of Teaching Woodwork in Twenty-Six Junior and Senior High Schools.* Ohio State University, 1936. Published: Ohio State University, 1936. 65 p.

A study to determine the extent to which accepted objectives of industrial arts have been employed and to determine the criteria used in the selection of content in woodworking. Twenty-six junior and senior high schools were studied during the year 1935.

2813. **RINGLE, VERLIN EDWARD** (M. S.). *High School Printing as a General Education Subject.* Oklahoma A. & M. College, 1932. 102 p.

A study of the printing trades in Tulsa, Oklahoma and printing as taught in the public schools of that city in 1932.

2814. **RIVERA, MANUEL MORALES** (M. A.). *The Status of Industrial Arts in Puerto Rico.* Colorado State College of Education, 1946. 154 p.

A survey of industrial arts, including organization, teacher preparation, problems of teaching, and opinions of school administrators and teachers concerning industrial arts.

2815. ROBB, THEODORE (M. A.) *A Study of State and City Courses in Industrial Arts Printing.* George Washington University, 1937. 68 p.

An investigation of the courses of study in the industrial arts aspect of printing. Those cities and states having written statements regarding this course are included.

2816. ROBERTS, PAUL BAYARD. *White Pine Industry of Maine.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 106 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the need for a study of the white pine industry in Maine as a suitable part of the shop program.

Source of Data: Questionnaire to 82 schools in Maine.

Findings and Conclusions: A pictorial presentation of processes in the white pine industry of Maine. An historical account of the industry and conservation methods employed.

2817. ROBINSON, FLOYD A. *Industrial Arts in Iowa and the Mid-West.* M. A., University of Minnesota, 1939. 81 p.

A comparative study of industrial arts in selected Iowa schools and certain other midwest cities of similar size (5,000-25,000 population).

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2818. ROBINSON, FRANK E. *Background of Prospective Elementary Teachers in Selected Industrial Arts Activities.* Ed. D., 1955, University of Missouri. 117 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the experience and informational background in pottery, woodworking and weaving of persons in Missouri preparing to teach in elementary schools.

Source of Data: An information form and test were constructed on the basis of the material and activity areas reported as being used with the greatest frequency in previous researches in industrial arts for elementary schools. The information form and test were administered to 135 seniors in elementary education at the State Colleges in Missouri and the University of Missouri.

Findings and Conclusions: Of those having experience in one or more of the areas, total experience ranged from one to 50 hours. The majority of these persons had obtained their experience at the college level through a wide variety of courses. The informational background of the group was found to be far below the level indicated as being desirable by specialists in the field. The group had the greatest amount of information about woodworking and the least about weaving. For purposes of preparing teachers to adequately handle industrial arts material and activity areas, pottery, woodworking and weaving should receive attention in the order named.

2819. ROGERS, MERLE LAWRENCE (Masters). *A Statistical Study of Vocational Education in the Central Rural Schools of New York State.* Cornell University, 1938.

2820. ROWLAND, MACON ROGERS (M. S.). *A Study to Determine the Need for Industrial Education in the Rural High Schools of North Carolina.* North Carolina State College, 1939. 54 p.

An analytical description of the status of industrial education in the rural schools of North Carolina based on the data and opinions of sixty rural high school principals.

2821. RUKAVINA, FRANK D. (M. S.). *Impact of World War II on Industrial Arts in Iowa.* Iowa State College, 1943. 82 p.

An investigation of the effects of World War II on industrial arts in Iowa for the school year 1942–1943.

2822. RULEY, MORRIS J. (Masters). *The General Industrial School in Sand Springs, Oklahoma.* Oklahoma A & M College, 1935.

2823. RUSSELL, ELLSWORTH M. (M. S.). *The Industrial Arts Curriculum in the Junior High Schools of Illinois.* Iowa State College, 1941. 59 p.

A study of what courses in industrial arts were being taught in the seventy-three junior high schools in Illinois and what courses the teachers of industrial arts believed should have been taught in 1940–1941.

2824. SANTEE, DONALD FREDERICK (M. S.). *A Survey of Industrial Arts in the Public Schools of Oregon.* Oregon State College, 1947. 78 p.

A follow-up survey of a similar study made in 1940. The following aspects of industrial arts are included: certification, content areas, professional preparation of teachers, teaching combinations of subjects, trade and teaching experience of teachers, salary, tenure enrollments, and teacher load.

2825. SCHAFER, REUBEN J. (M. S.) *A Survey of the Industrial Arts Shop Libraries in the Public Junior and Senior High Schools Located in the Western Half of Wisconsin.* Iowa State College. 87 p.

A survey of forty-six libraries in western Wisconsin on the organization, maintenance, and use of libraries. The author, title, and frequency of 365 industrial arts books are given.

2826. SCHECTER, PEARL S. (Masters) *Fine and Industrial Arts in the Activity Program of the New York City Elementary Schools.* Teachers College, Columbia University, 1938.

2827. SCHUBERT, WILLIAM H. (M. A.) *Evaluation of Home Mechanics Content Based Upon a Survey of Jobs Done in the Home.* Iowa State College, 1934. 58 p.

An investigation of one hundred homes in Ames, Iowa, as to the type of jobs done in the home.

2828. SCHULTZ, CHESTER ALFRED. *Industrial-Arts Needs of a Rural Community.* M. S., 1951, Illinois State Normal University. 61 p. Library, Illinois State Normal University, Normal.

Purpose: To ascertain what tools, machines, and materials rural patrons think their children should learn about in an industrial-arts program, and to learn rural adult interests for course work in industrial arts.

Source of Data: Data were obtained from a combined check list and questionnaire.

Findings and Conclusions: The tools, machines, and materials approved by a majority of the patrons should be included in the industrial-arts program. Woodworking and acetylene and arc welding should be considered first for adult classes in rural communities if the interests of the adults are to be met. The best time for rural adult programs to meet would be during winter months.

2829. SCHWERTZLER, ANNA W. (Masters). *A Survey of the Boys of the Unit Trade and the Cooperative Departments of the Toledo Vocational School for the Years 1928–29 and 1929–30.* University of Michigan, 1932. 41 p.

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2830. SEEFIELD, KERMIT A. *The Competences of Industrial Arts Teachers.* Ed. D., September, 1949, Stanford University. 258 p. Cubberley Library, Stanford University, Palo Alto, Calif.

Purpose: To determine the qualifications and characteristics which a good industrial arts teacher must have.

Source of Data: A questionnaire was devised and submitted to teacher educators, supervisors, and coordinators of industrial arts. This questionnaire was divided into three parts: Ranking of objectives, Rating of Characteristics, Ranking of characteristic groupings.

Findings and Conclusions: Success, while dependent in the final analysis on the behavior of the teacher and the subject matter achievement of the student, is actually measured by the citizenship qualities in the boys and girls who take industrial arts. Success of the industrial arts teacher in this study was rated in terms of the citizen product as determined by the personal and professional characteristics of the teacher.

2831. SELLHORN, RALPH D. *Federally Aided Vocational Education in Nebraska.* M. A., University of Minnesota, 1939. 64 p.

Progress of federally aided vocational education. A documentary study of the types and numbers of schools and classes in Nebraska from 1916 through 1939, including teaching training for the six services.

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2832. SENTENEY, GEORGE W. *Factors Relating to the Choice of Industrial Education Teaching as a Career and the Retention of these Teachers in the Profession.* Ed. D., 1955, University of Missouri. 97 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the factors influencing men to enter an industrial teacher education program in college, why those so trained either teach or follow other occupations, how the two groups compare as to background, and how they fare in relation to each other.

Source of Data: Questionnaires were completed by 1356 graduates of 61 industrial teacher education institutions throughout the United States. The teaching and nonteaching graduates were compared by using the chi-square test of independence.

Findings and Conclusions: Significant differences were found to exist between the teaching and non-teaching graduates as follows: size of the community in which they were reared; highest school grade completed by their mothers; chief occupations of their fathers; whether or not they had teaching experience in military service; type of institution from which they were graduated; year of graduation from college; degree held; gross annual salary; job adjustment. Those graduates who are reared in smaller communities are more likely to remain in teaching than are those who come from larger cities. The fact that he has trained to be a teacher is the most important single reason for a graduate of an industrial teacher education program to enter teaching. More attractive salaries in other occupations is the primary reason given by those graduates who do not teach.

2833. SEWART, JR., WALTER E. *Vocational-Industrial Training For Negroes in the Southern States.* M. S., 1952, Okahoma Agricultural and Mechanical College. 48 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the status of reimbursed day trade, part-time and evening programs in the southern states.

Source of Data: Data were obtained through questionnaires from state supervisors and Negro teachers of trade and industrial education in the southern states, and from the U. S. Office of Education.

Findings and Conclusions: Many day trade programs exist in the various states. There are few evening and part-time programs. The diversified occupations and evening adult programs appear to be low in course offerings, as well as enrollment.

2834. SEXTON, DORIS E. (Masters). *A Study to Discover the Courses Now Recognized as Related Subjects in the Vocational Industrial Schools in the States of the North Atlantic Region.* University of Pennsylvania, c. 1935–47.

2835. SHARP, RALPH W. (Masters). *A Study of Certain Agencies in Columbus, Ohio, Offering Vocational Training of Less than College Grade.* Ohio State University, 1931.

2836. SHEHANE, BARNEY ARTHUR (M. A.). *Industrial Arts and Vocational Education.* University of Arizona, 1939. 91 p.

This study aims to evaluate the service given to industrial arts and to vocational education. It points up the importance of industrial arts training at Phoenix Union High School in prevocational training and also in assisting pupils with vocational plans. The value of providing pupils with contacts with men in industry is considered.

2837. SHELBY, GRANT EUGENE. *Industrial Arts in the Junior High School.* M. Ed., 1952, Central Washington College of Education. 132 p. Library, Central Washington College of Education, Ellensburg.

Purpose: To set up a program of industrial arts for the junior high schools in accordance with the present philosophy and objectives of industrial arts.

Source of Data: Data were obtained from books, pamphlets, films and charts.

Findings and Conclusions: Industrial arts in the junior high school should be broad in scope and exploratory in nature.

2838. SHIELS, JOHN WILLIAM (M. A.). *A Study of Course Offerings in Pre-Flight Aeronautics in Some Catholic Boys High Schools of the United States.* Catholic University of America, 1943. 72 p.

An investigation of aeronautical courses of study in 142 schools to determine the amount of co-operation given the armed forces in preparing the youth for service and equipping them for the "Air Age". The extent, requirements for teachers, and the significance of such training in the Catholic schools are discussed.

2839. SIKANEN, GEORGE R. *Recommended Activities for Industrial Arts and Crafts in Detroit Public Schools with Consideration for Essential Supplies and Equipment.* M. Ed., 1953, Wayne University. 50 p. Industrial Education Department, Wayne University, Detroit, Mich.

Purpose: To ascertain desirable activities to teach in the general industrial arts and crafts shops in Detroit schools and to make a supply and equipment list for these activities.

Source of Data: Data were obtained from a questionnaire sent to teachers of arts and crafts and intermediate school department heads in Detroit.

Findings and Conclusions: Certain activities in wood, plastics, leather, metal, ceramics, and general activities are recommended for the industrial arts and crafts shops. Activities considered dangerous, unsafe, or unadaptable to large classes are discouraged. Seven recommendations were forwarded to the Detroit Board of Education concerning essential supplies and equipment for teaching, desirable activities, basic materials provided for the student, purchase of the supplies, books, meetings, and a special supervisor for the arts and crafts program in Detroit.

2840. SIMMERING, LAWRENCE F. (M. S.). *Student Interest In and Parental Attitude Toward Industrial Arts in the Ames Public Schools.* Iowa State College, 1946. 83 p.

A study to ascertain the interests in industrial arts of the students attending the Ames public schools, and to determine the attitudes of the parents regarding the various units of work that might be offered their children in this field.

2841. SIMMONS, DARRELL DeWITT. *The Status of Industrial Arts in the State of South Dakota.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 63 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To answer the questions: How many schools in the State have industrial arts? How large should a school be in order to include industrial arts? How much equipment is necessary? What are the salaries of industrial arts teachers in South Dakota? What can the industrial arts teacher in South Dakota do to improve industrial arts program in the State?

Source of Data: Two research methods were used in this study, "documentary" and "inquiry forms." The writer visited the offices of the State Department of Education in Pierre and examined reports of superintendents on file there. He also sent out inquiry forms to superintendents in all schools with 100 or more pupils. He then sent inquiry forms to all industrial arts teachers in these schools.

Findings and Conclusions: It was found that 89 of the 310 high schools have industrial arts. One hundred and ten industrial arts teachers meet students from 40 North Central Association Schools and from 49 State accredited schools. Only one-half of the students in South Dakota high schools have access to courses in industrial arts. Schools having industrial arts have from 14, the smallest high school having industrial arts, to 1,800, the largest. Class size varies from 4 to 37 with an average class size of 15. Salaries range from $1,900 to $3,800. Many industrial arts teachers are also principals or superintendents and their salaries range up to $4,050. Need was recognized for a State organization of industrial arts teachers to produce objectives, study guides, courses of study and teacher manuals. A State supervisor would find a full-time opportunity to guide in these activities. Many other professional improvement proposals were made, including a recommendation for a State advisory committee.

2842. SINGLETERRY, TEARL (M. S.). *Industrial Arts in Oklahoma High Schools.* Oklahoma A & M College, 1934. 31 p.

An investigation of 309 Okahoma high schools to determine the number of schools offering industrial arts, the qualifications of teachers, number of students enrolled in industrial arts, the tenure of teachers, and the cost of equipment.

2843. SKOCH, CARL EUGENE. *Value of Industrial Arts Training for Terminal Junior High School Boys.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 94 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the employability of terminal junior high school boys, what qualities and skills employers desired in these boys, how many drop-outs selected hobbies that reflected previous industrial arts training, and what industrial arts subjects needed to be emphasized in the junior high school.

Source of Data: Data were obtained through interviews with 100 boys who had dropped out of junior high school during the years 1947 through 1951 and from interviews with 20 employers of these drop-outs.

Findings and Conclusions: Seventy-two per cent of the drop-outs were employed, 36 per cent being in jobs related to industrial arts. Forty per cent of the drop-outs did not have a hobby. Auto mechanics was the type of job desired by most of the drop-outs. The majority of employers of drop-outs preferred certain personal qualities in their workers rather than trade skills.

2844. SMITH, FRANK HARVEY (M. S.). *A Survey of the Industrial Arts Courses in the Elementary Schools of Fresno County.* University of Southern California, 1941. 91 p.

A study of industrial arts courses given in elementary schools in Fresno County from points of view of number, content, objects, and methods. It emphasizes hobby activities and the proper teaching of the use of tools.

2845. SMITH, FREDRICK MARTIN (M. S.). *Evaluation Survey of Industrial Arts Laboratories in Northwest Missouri.* Iowa State College, 1938. 76 p.

2846. SMITH, IVAN W. (M. S.). *Nature and Extent of Elementary Industrial Arts in South Dakota.* Iowa State College, 1937. 152 p.

An analytical survey to determine the nature and extent of the industrial arts being taught in the elementary schools of South Dakota by means of an examination of the printed state courses of study.

2847. SMITH, L. D. (M. A.). *A Survey of Vocational Training Facilities in Pennsylvania.* University of Pittsburg, 1933. 237 p.

A description of vocational education opportunities in Pennsylvania in 1933 presented through an analysis of college, business, and trade school catalogs and bulletins.

2848. SMITH, RALPH B. *A Survey of Industrial Arts Laboratories in Five Counties of Eastern Ohio.* M. A., 1948, Ohio State University. 81 p. Education Library, Ohio State University, Columbus.

Purpose: To determine the extent to which the schools were fulfilling the objectives of industrial arts education as formulated by the Ohio standards.

Source of Data: Thirty schools were surveyed by questionnaire and observation.

Findings and Conclusions: As soon as practicable room especially designed for work in industrial arts be provided. A budget be provided. Instructors make wider use of existing equipment. Teaching aids be used more extensively.

2849. SNIDE, AMOS C. (M. A.). *A Survey of Industrial Arts in the Muskingum Valley Conference.* Ohio State University, 1940. 101 p.

This study, made immediately preceding World War II, is a comparison of course offerings and shop laboratories in the seven high schools which make up the Muskingum Valley Conference.

2850. SPILLERS, WILLIAM H. (Masters). *A Vocational Survey of Some of the Smaller High Schools of Fresno County.* Stanford University, 1929.

2851. STANLEY, ARTHUR E. (M. A.). *Analysis of Industrial Arts in Colorado.* Colorado State College of Education, 1933. 123 p.

A descriptive analysis of industrial arts as a subject, including offerings, equipment, methods, teaching aids, and libraries.

2852. STANSBURY, EDGAR BRYANT (M. A.). *Status of Industrial Arts in the Secondary Schools of Kentucky.* George Peabody College, 1933. 172 p.

A study of the industrial arts offerings in the secondary schools of Kentucky. Consideration is given to the factors which influence industrial arts progress, and observations concerning the future of such programs are made.

2853. STEPHER, ELMER F. (M. S.). *Status of Aviation Instruction in Teacher Education Programs in the United States.* Iowa State College, 1946. 34 p.

A survey to present and evaluate the offerings in the field of aviation instruction in the majority of junior colleges, teachers colleges, colleges of arts and science, and similar institutions of the United States.

2854. STARK, MENZO H. (Master). *Industrial Arts Opportunities in the Country Schools of Ohio.* Miami (Ohio) University, 1940.

2855. STEINBERG, WILLIAM B. (M. S.). *A Study of High School Industrial Arts Courses Offered in Arizona.* Oregon State College, 1941. 87 p.

A survey of the facilities for industrial arts classes in Arizona high schools. It considers the time allotment, credit toward graduation, number of pupils, space for shops, equipment available, and the objectives served in an effort to point up the need for improvement.

2856. **STEINER, RUSSELL Q.** *A Study of Industrial Arts Education in the Consolidated High Schools of Indiana.* M. A., University of Michigan, 1934. 50 p.

Seeks to bring together pertinent data relating to the status of industrial arts education in the Consolidated High Schools of Indiana.

2857. **STEWART, DANIEL KERMIT (M. S.)** *Industrial Education, Survey of Raleigh, North Carolina.* North Carolina State College, 1931. 78 p.

A description of a survey made by the "Raleigh Times" of the industries of Raleigh, North Carolina to assist in determining the industrial education curriculum needs.

2858. **STEWART, RICHARD B. (Masters).** *A Comparison of Salaries, Tenure, and Experience of Superintendents, Principals and Teachers of Vocational Agriculture, Manual Arts and Athletics in Iowa High Schools.* Iowa State College, 1930.

2859. **STRAUSS, DOROTHY M. (Masters).** *The Relation of the Art Department to Other Divisions in the Madison Vocational School and the Application of Art Principles to Vocational Education.* University of Wisconsin, 1930.

2860. **STRICKLAND, THOMAS WHITNEY (M. A.).** *A Study of Industrial Arts Teaching Personnel in Florida High Schools Accredited by the S. A. C. S. S.* University of Florida, 1947. 44 p.

A review of industrial arts courses as offered in Florida high schools during the period 1941–1946, with emphasis given to teacher salaries, turnover, and teacher course loads.

2861. **SWINDELL, GEORGE W. (M. A.).** *A Survey of Industrial Arts in the Schools of Warren County.* *Ohio State University,* 1939. 63 p.

A survey which attempts to find the status of industrial arts laboratories and courses in the several schools of Warren County, Ohio. Ways and means of improving the existing conditions, based on the Ohio High School Standards and other authoritative sources, are recommended.

2862. **TAYLOR, JAMES R.** *A Comparative Study of Trade and Industrial Education For Negroes in the Southern Region During the Year 1949–50.* M. A., 1951, University of Minnesota. 63 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: **To ascertain the status of trade and industrial education in the southern region, to evaluate the effort being made by each state, and to encourage and promote a substantial program for its Negro citizens.**

Source of Data: **Data were secured from 14 of the 17 chief state officers of trade and industrial education.**

Findings and Conclusions: **Over a 15 year period there was substantial improvement in all areas of day-trade classes, while part-time and evening classes showed very little improvement. Four states were making little effort to improve their program, and three states showed little variety in course offerings.**

2863. **TEMPLE, EDWARD HOLLIS (Masters).** *Facilities for Seventh, Eighth, and Ninth Grade Industrial Arts in Certain Cities and Towns of New England.* Boston University, 1934.

2864. **TESSMER, ARTHUR WILLIAM (M. S.).** *A Survey of Industrial Education in Alaska.* Oregon State College, 1941. 65 p.

A study of the facilities (1940–41), curricular programs, and local applications of industrial arts in the public schools of Alaska. It shows the need of adapting applications to occupational and geographic conditions, as well as to the general objectives of industrial arts.

2865. **THOMAS, CHARLOTTE B. (Masters).** *Status of Crafts in the Los Angeles High Schools.* University of Southern California, 1935.

2866. **THOMAS, JAMES E.** *The Industrial Arts Program in the Oak Ridge Schools, Oak Ridge, Tennessee.*

M. S., 1950, The University of Tennessee. 131 p. Library, University of Tennessee, Knoxville.

Purpose: To determine the objectives of industrial arts teachers in Oak Ridge schools; to determine what facilities are provided for classroom and laboratory work; to determine what equipment is available; and to determine the place of industrial arts in the over-all school program.

Source of Data: Data were scured from textbooks, magazines, pamphlets, bulletins from the Department of Education of several States, office files of the Oak Ridge School, observation of students undergoing instruction, and personal interview with teachers.

Findings and Conclusions: Objectives of industrial arts in the junior high school; exploration; general guidance, household mechanics; hobbies, social habits and insight; consumers knowledge and appreciation; manipulative skill, correlation of integration; vocational. Objectives of industrial arts in senior high school; interest in industrial life; ability to select, care for and proper use of purchased articles; appreciation of good workmanship and design; self-reliance and confidence; self-discipline; orderly work habits; readiness to assist others; courtesy and consideration for others. Seventh and eighth grade boys take industrial arts for 2 hours each week; 9 weeks of metal work, 9 weeks of drawing; and 18 weeks of woodwork. Industrial arts are electives in the senior high school. Courses are offered in architectural drafting, cabinet making, general woodworking, machine shop and mechanical drawing for which credits are earned, not exceeding six. A brief description of the industrial arts courses listing the instructional units, projects, hand tools, power tools, and the information topics is included. Industrial arts supplements the general educational program in that it helps the individual to discover and develop his talents, and to become a better citizen.

2867. THOMPSON, FRANK W. *Classroom Teachers' Viewpoints of Elementary Industrial Arts.* M. S., 1952, Illinois State Normal University. 76 p. Library, Illinois State Normal University, Normal.

Purpose: To report the viewpoints of 136 Illinois classroom teachers on several selected phases of elementary industrial arts.

Source of Data: Data were obtained from a questionnaire sent to elementary teachers of Bloomington, Illinois and other selected schools.

Findings and Conclusions: Elementary industrial arts should be practical and should meet the life needs of children in creative expression and in development of skills. The usual classroom is not adequate for teaching industrial arts; a specially equipped room is needed. The scope of activities now used in classrooms is broad and incorporates a variety of media. Industrial arts should be correlated with many academic areas.

2868. THURMAN, HENRY LOUIS (M. A.). *A Study of Industrial Educational Programs in a Selected Number of Secondary Schools for Negroes in Virginia.* Hampton Institute, 1946. 49 p.

A statistical study of twenty secondary schools (school year 1945–46) to determine the adequacy of the curricula regarding the number of hours for shop work and hours for related work.

2869. TINKLE, HENRY CLIFF. *The Status of Industrial Arts in Oklahoma High Schools in 1946.* M. S., Oklahoma Agricultural and Mechanical College, 1946. 92 p.

An account of the nature and extent of industrial arts in Oklahoma high schools in 1946.

2870. TORGERSON, ROLAND M. (M. A.). *Unit Operations In Junior High School Woodwork—Their Selection and Their Ranking as to Importance, Time, Difficulty and Necessary Drill.* University of Minnesota, 1931. 120 p.

A survey of the operation in bench woodwork as listed in journals, published courses of study, texts, problem books, and job sheets, for the purpose of determining what should be taught at the junior high school level.

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2871. TRICHE, ANDREW, Jr. (Ph. D.). *Vocational Education: A Comparative Study of Vocational Education in the Forty-Eight States.* Pennsylvania State College, 1933. 72 p.

A study of the conditions existing in the United States during 1931 regarding the efforts of states in assisting in vocational education and the results of these efforts. States are compared as they support agriculture, trade and industrial, and home economics education.

2872. TURNER, JOSEPH WILLIAM. *A Comparative Study of Louisiana*

White and Negro Secondary Schools Offering Industrial Education. M. S., 1949, Louisiana State University. 155 p. Library, Louisiana State University, Baton Rouge.

Purpose: To determine whether the State of Louisiana provided equal educational facilities in white and Negro Secondary public schools offering industrial education.

Source of Data: Using the normative method of educational research, an interstate twelve hundred mile trip was made, with eight "representative" schools visited, and staffs and faculties interviewed. Checksheets were broken into the following divisions: Enrollment, attendance, school sites, physical plants, curriculum offerings, library facilities, administrative areas, teacher qualifications, pupil-teacher ratios and offerings, and equipment in industrial education shops.

Findings and Conclusions: Although not all democratic objectives have been reached, it was concluded that secondary schools offering industrial education were playing a major role in providing equal rights for Negroes. All Negro schools in Louisiana except a rare few are labelled "Negro." It is recommended that hereafter Negro schools be named for educators, scientists, patriots, etc., of their own, or of the white race. Also, it is recommended that the Louisiana State Board of Education list all schools of the State as "Louisiana schools" not as "white schools" or "Negro schools." The question arises, "Are white schools overstaffed?" because the few member staffs of the Negro schools equal in enrollment to white schools accomplish as much as the many member staffs of the white schools, i. e., they maintain equal educational standards and disciplinary standards. On the average, equal facilities and equipment were offered for both Negro schools and for white schools. But the facilities and equipment were more advantageously used by the Negro than by the white.

2873. TURNER, ROY W. (Masters). *A Study of Industrial Arts and Vocational Teachers as to Salary, Educational Status and Teachers' Load in West Virginia.* Ohio State University, 1931.

2874. UPHOFF, CLINTON R. (M. A.). *Industrial Arts in Kentucky.* University of Minnesota, 1941. 92 p.

A survey of the industrial arts situation in Kentucky regarding the teacher, his work, his subject, his training, and his salary in widely scattered schools under differing circumstances. Course offerings and administrative practices relative to the industrial arts department are included.

2875. VALK, DONALD NICHOLAS. *Survey of Industrial Arts in the Small School Systems in Michigan.* M. S., University of Michigan, 1931. 53 p.

A detailed description of industrial arts programs in the small high-school systems of Michigan.

2876. VAN ARSDALE, GORDON DUNCAN (M. S.) *Welding as a Medium of Instruction for Industrial Arts.* Oregon State College, 1947. 188 p.

A survey of opinion regarding the status and value of welding in secondary schools of California. The appendix includes industrial statistics and a proposed course of study illustrated to show equipment and suitable projects.

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2877. VANDEBERG, LOYD WALLACE. *Educational Needs of Prospective Home Owners Concerning the Acquisition and Ownership of a House.* Ed. D., 1955, University of Missouri. 101 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the educational needs of prospective home owners in the state of Washington concerning the problems involved in selecting, purchasing, constructing, and maintaining and repairing a house.

Source of Data: Data were obtained via printed information forms from 424 home owners and 76 specialists in the state of Washington. The specialist group was composed of architects, real estate dealers, and building contractors. The data were tabulated, and the recommendations of the respondents are presented in the form of tables.

Findings and Conclusions: Four-fifths of both home owners and specialists indicated that it is important for prospective home owners to know how to select, purchase, plan and contract for construction, and maintain and repair a house, and 51 per cent of the home owners expressed a desire to know more concerning these items. A course of instruction in the selection, purchase, planning and contracting, and maintenance and repair of a house should be made available to interested high school students and to adults in the community, in the evenings, during the winter season, annually. The classroom teacher should have the aid of specialists in teaching all phases of home acquisition and ownership.

2878. VAN WYEN, ADRIAN (Masters). *A Program of Industrial Arts Activity in the Elementary Grades and Its Relation to the Training of Teachers.* Kent State University, 1938.

2879. VEGA BRAU, IVAN. *Industrial Arts in Puerto Rico—Its Status and Projection.* M. A., 1948, Ohio State University. 167 p. Education Library, Ohio State University, Columbus.

Purpose: To make a status inquiry of industrial arts education in Puerto Rico and to recommend changes which will provide rich experience for the children of Puerto Rico.

Source of Data: Data was secured through a 5-page questionnaire sent to 345 teachers. Data concerned courses, enrollment, teacher preparation, objectives, areas, methods, loads, and grade levels.

Findings and Conclusions: Industrial arts programs are widely dispersed. A lack of qualified teachers exists. A need for a diversified program of activities. Recommended areas included ceramics, graphic arts, commerical arts, machine shop and blueprint reading. There is a need for industrial arts at the elementary level.

2880. VOSS, GORDON O. *Industrial Arts in Minnesota.—Part IV.* M. A., University of Minnesota, 1945. 96 p.

A detailed report on industrial arts in Minnesota for the school year 1937–38.

2881. WADDELL, J. HOWARD (M. S.). *A Study of Industrial Arts Students in County Senior High Schools of Cumberland, Maryland.* University of Tennessee, 1934. 96 p.

A survey of 136 Allegany high school and Pennsylvania high school students, conducted during the school year 1932–1933, to determine the occupations students expect to follow and the factors influencing students' choice.

2882. WAGONER, R. GRAHAM. *A Descriptive Analysis of the Teachers of Industrial Arts in Missouri,* M. A., 1949, Colorado State College of Education. 141 p. Library, Colorado State College of Education, Greeley.

Purpose: To prepare a descriptive analysis of the teachers of industrial arts in the elementary, junior high, and senior high schools of Missouri.

Source of Data: Data were obtained from the files of the office of the State Supervisor of Industrial Arts for the State of Missouri, and from question lists sent to the industrial arts teachers of Missouri.

Findings and Conclusions: Most of the teachers of Missouri are well qualified for the job they are supposed to do. The teachers colleges and universities of Missouri are supplying only a part of the teachers of industrial arts as 43 different institutions were listed as a source. The total of amount of teaching experience directly influences salaries, as there appeared a correlation between these where all other reasons showed no relationship. Class size is smaller by 7 students in the towns and cities outside of Kansas City and St. Louis. Most of the shop courses now meet 5 days per week on all grade levels.

2883. WAHTERA, KOUKO A. (M. S.). *Industrial Arts Policies in the State of Michigan.* Iowa State College, 1941. 111 p.

A questionnaire study of the policies in industrial arts in the state of Michigan. The questionnaires were filled out by teachers of industrial arts in Michigan.

2884. WALKER, LAWRENCE A. *Comparative Achievement of Former Pupils in Industrial Education.* M. S., 1950, Iowa State College. 27 p. Library, Iowa State College, Ames.

Purpose: To compare the achievements of graduates who took industrial arts with those who took vocational training in high school.

Source of Data: Data were obtained for 150 former pupils of the Phillis Wheatley High School, San Antonio, Texas; 75 with industrial arts training and 75 with vocational training.

Findings and Conclusions: A higher percentage of the industrial arts group took and completed college work. There were no significant differences in the economic backgrounds of the two groups.

2885. WALTER, CHARLES BERNARD. *Industrial Arts in the Junior High Schools of Montana.* M. Ed., 1951, Montana State University. 82 p. Library, Montana State University, Missoula.

Purpose: To ascertain the status of industrial arts in the junior high schools of Montana, and to offer suggestions for its improvement.

Source of Data: Data were secured by questionnaires, visitation, and observation of junior high school teachers.

Findings and Conclusions: About 56 per cent of the junior high schools offer an industrial arts program, consisting almost exclusively of woodwork. The program lacks state leadership. Objectives are not clear. Teachers are not always prepared to teach industrial arts.

2886. **WALTERS, GULLY S.** (M. A.). *Extra-Course Industrial Arts Work.* Colorado State College of Education, 1938. 58 p.

A survey of the extent of extra-course work in industrial arts in Oklahoma. Attention is given to areas where most of the work is placed.

2887. **WARRICK, GLENN D.** (M. A.). *Industrial Arts Objectives in the Secondary Schools of the North Central Association.* Colorado State College of Education, 1946. 119 p.

A survey of the North Central Association to find what objectives are considered important by the industrial arts teachers of twenty states.

2888. **WATERS, HOWARD D.** (Masters). *Industrial Arts Education in the State of Georgia: Its Status and Projection in the Public Schools.* Ohio State University, 1942.

2889. **WATERS, JOHN ANTHONY** (Masters). *A Survey of Industrial Arts Education in the Public High Schools of Rhode Island.* Brown University, 1939.

2890. **WELCH, CARL D.** *Industrial Arts In Elementary Schools With Reference To Thirty-Five Elementary Schools In Missouri.* M. S., 1953, Kansas State Teachers College. 65 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To analyze the industrial arts program carried on in thirty-five elementary schools in Missouri.

Source of Data: Data were obtained from literature and a questionnaire.

Findings and Conclusions: Fourteen different areas of industrial arts were being taught in the schools studied. The largest number of schools offered three areas. Industrial arts was being taught almost exclusively in the sixth and seventh grades, very little in the lower grades.

2891. **WELTY, HENRY D.** (Masters). *A Study of the Industrial Arts in the Akron Central High School.* Ohio State University, 1931.

2892. **WESTWICK, MERLIN T.** (Masters). *Analysis of the Content of the Industrial Arts Program in Iowa Junior High Schools.* State University of Iowa, 1945.

2893. **WHITESELL, HARRY SELLERS** (M. A.). *A Study of Vocational School Programs in Ten Cities in the United States.* George Washington University, 1940. 116 p.

A comparative study of the vocational programs current in ten cities in 1940. Consideration is given to the similarities in the courses offered with emphasis on the administration and organizational aspects of the programs.

2894. **WHITTIER, CHARLES TAYLOR** (Masters). *Present Status of Vocational and Non-Vocational Courses in Industrial Education in 79 Secondary Schools.* University of Chicago, 1938.

2895. **WIDDOWSON, H. T.** *Industrial Arts in Minnesota.* M. A., University of Minnesota, 1937. 36 p.

A documentary canvass of industrial arts enrollments, offerings, schedules, salaries, operation costs, etc., in Minnesota over a recent 6-year period.

2896. **WIEBE, PETER A.** (Masters). *A Study of Methods Used in Teaching Industrial Arts in Exempted Villages in Ohio.* Ohio State University, 1934.

2897. **WILLIAMS, BURTON T.** (M. S.). *An Analysis of Fifty Courses of Study in Junior High School Woodwork.* Iowa State College, 1936. 65 p.

An analysis of courses of study collected from twenty-four states with the aim of refining and improving them.

2898. **WILLIAMS, JAMES EDWARD.** *A Status Study of Industrial Arts In The Public Schools of Florida, 1951-1952.* M. A. E., 1952, University of

Florida. 146 p. Library, University of Florida, Gainesville.

Purpose: To ascertain the status of industrial arts in the public schools of Florida, and to forecast probable future conferences.

Source of Data: Data were gathered from various educational departments in Florida, questionnaires, visitations, and conferences.

Findings and Conclusions: The areas in which the number and scope of offerings will probably increase are those of electronics and plastics. New laboratories are now in evidence and, barring a national economic recession, will increase in number at a slow but steady pace. The outlook for the future is favorable.

2899. WILLIAMSON, MERRILL D. *A Study to Determine A Sound Industrial Arts Program For The Northwest School.* M. S., 1952, North Texas State College. 106 p. Library, North Texas State College, Denton.

Purpose: To develop an industrial arts program to fit the needs of the Northwest Community High School.

Source of Data: Data were obtained from books, magazines, pamphlets, school documents, unpublished related studies, and a study of community needs.

Findings and Conclusions: There seemed to be more interest in crafts than in other phases of industrial arts.

2900. WINESBURG, ELBERT H. *The Grades of Students in Vocational and Academic Courses, as Compared With The Occupation of Their Fathers.* M. S., 1953, Kansas State Teachers College. 47 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the relationship between the grades of students in high school and the occupation of their fathers.

Source of Data: Data were obtained from the permanent records in the Pittsburgh Senior High School, Pittsburg, Kansas, for the years 1948–1952, inclusive, and literature.

Findings and Conclusions: The father's occupation, and his social-economic status has a definite relationship to school success and vocational choice.

2901. WOOD, LEWIS H. (Masters). *Status of Practical Arts and Vocational Education in Public Educational Systems.* University of Wisconsin, 1931.

2902. WOODIN, J. C. (M. S.). *The Wichita Plan of Training Airplane Mechanics.* Colorado Agricultural & Mechanical College, 1939. 76 p.

A description of the Wichita Training Program for airplane mechanics. Conditions that led to the organization of this program and the operation of the present program are reviewed.

2903. WOODWARD, ROBERT EARL (Masters). *Industrial Arts in White Senior High Schools of West Virginia.* University of Kentucky, 1937.

2904. WRIGHT, CHARLES R. (Masters). *A Study of the Values of the Industrial Arts Exploratory Courses as Offered in the Junior High Schools of Amarillo, Texas, 1938–39.* East Texas State Teachers College, 1939. 118 p.

2905. YOUNG, GEM G. (M. A.). *Vocational Education Under Federal Aid.* University of Minnesota, 1934. 94 p.

A comparative study of annual reports of the Federal Board for Vocational Education, 1918–1932, concerning nine selected states. A comparison of enrollments, teachers in service and training, and expenditures is included.

2906. YOUNG, LEON A. J. *A Survey of Braham High School Graduates and Students Who Had Industrial Arts During the Period, 1945 through 1954.* M. S., 1954, Stout State College. 59 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the merits of certain practices, the usefulness of the shop courses, and to gather some opinions as to possible improvement in future offering.

Source of Data: Data were obtained from a questionnaire sent to Braham High School graduates from 1945 through 1954 who had had industrial arts courses.

Findings and Conclusions: The carpentry, electricity, and metal work areas should be expanded. Designing should receive more emphasis. Demonstration and lectures should be integrated. The respondents indicated that the shopwork they had had was useful to them and they were highly favorable to the personnel system. The group believes that more emphasis should be given to "machine tool skills" and to "accuracy and standards" in the industrial arts work.

2907. ZABEL, SELVIN MERLIN. *Industrial Arts in The Elementary School.* M. A., 1954, University of Minnesota. 86 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To describe the industrial arts activities in the elementary school and to ascertain the manner in which the industrial arts teacher can aid with industrial arts activities in the elementary school.

Source of Data: Data were obtained by questionnaire from the public schools of Minneapolis and St. Paul and from library references.

Findings and Conclusions: The industrial arts activities are an integral part of the elementary school curriculum. The industrial arts teacher can aid the elementary teacher in many ways with the industrial arts activities. In this case he should have a knowledge of elementary teaching methods.

2908. ZIEGENHAGEN, FREDERICK W. (Masters). *Survey of Technical Education in Milwaukee.* University of Wisconsin, 1935.

2909. ZWICK, MELITA (Sister) (M.A.). *The Need for a Vocational School for Boys on a Secondary Level in the Catholic School System of San Antonio.* Catholic University of America, 1941. 74 p.

An analytical study of the needs for a Catholic vocational school from the pupil-need point of view. Intelligence and vocational interests tests were given to secondary school boys to determine their interests and abilities for vocational education.

Industry, Occupation, and Community Surveys

2910. ADOLPH, JACOB (M. A.). *A Survey of the Prevocational, Vocational, and Industrial Arts Fields in the Junior and Senior High Schools of Arizona.* Colorado State College of Education, 1930. 99 p.

A survey of industrial education courses offered in Arizona schools in 1930, and the relationship of the courses to community needs.

2911. ANDERSON, MARCEL L. (Masters). *The Educational and Vocational Opportunities for Negroes in Columbus, Ohio.* Ohio State University, 1936.

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2912. ATTEBERRY, PAT H. *Nature And Amount Of Pre-Employment Training Needed For Entry Occupations In The Kansas City Labor Market Area.* Ed. D., 1954, University of Missouri. 191 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the nature and amount of pre-employment training needed by workers in entry occupations in Kansas City, and the extent to which existing educational programs were meeting these needs.

Source of Data: Job opportunities available to high school youth were obtained from 1950 Census of United States; data dealing with nature and amount of pre-employment training needed were secured by interviewing 29 selected employers; and training completed by high school graduates was collected from school records.

Findings and Conclusions: Females in Kansas City were employed principally as clerical workers. Males, in the main, worked as semi-skilled and skilled craftsmen in manufacturing, construction, and communication. Employers preferred the high schools give two years of specialized pre-employment training for only the skilled crafts, clerical, and certain technical occupations. For beginning workers in the semi-skilled operative jobs, employers preferred approximately one year of training of a general nature. Although 75 per cent of the employers prefer beginning workers for entry jobs who are high school graduates, only approximately 50 per cent require this as a hiring policy. The proportion of male high school graduates completing two years or more of day-trade training fell far short of the proportion of males working in skilled industrial occupations. A larger proportion of white females were completing two years or more of commercial education than the proportion of white females employed in clerical occupations. The ratio of Negro female high school graduates completing two years or more of commercial courses to those Negro females employed in the clerical occupations was six to one.

2913. BARTLOW, ELTON O. (Masters). *Vocational Education Implications,* *Based upon a Survey of Occupational Fields, Needs and Expressed Desires.* Ohio State University, 1939.

2914. BETTERLEY, MELVIN L. *An Occupational Survey of Fourteen Trades in Selected Industries of the Duluth Area.* M. A., University of Minnesota, 1939. 97 p.

A study of 14 trades in an attempt to learn the number of boys normally to be absorbed by industry, fields of opportunity, and qualifications most likely to assure them of employment as a basis for improvement of vocational education in Duluth, Minn.

2915. BOSTON, CECIL W. Occupational Opportunities and Vocational Training Needs for Negroes in Daytona Beach, Florida. M. S. in Ed., 1949, Cornell University. 92 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To find out what the employment opportunities in the community are. To ascertain to what extent the vocational education program is meeting the needs of the community. To discover in what respects the program can be modified to serve the community more effectively.

Source of Data: Questionnaires were prepared to be used in interviewing all persons concerned with employment and training. Questions sought answers to 8 categories: Working force; payroll titles of employers; employee recruitment sources; selection practices; employee services; basic physical disqualifications; essential traits required; and abilities to be developed in schools. Questionnaires for the schools were prepared to elicit information concerning: The working force; payroll titles; number of pupils, and courses offered.

Findings and Conclusions: The major Negro employment opportunities in Daytona Beach are in service occupations. The community does not have any medium size or large industries. A large number of those seeking employment are seasonal visitors and transient workers. The present training programs appear not to be meeting the needs of the community adequately. Evening vocational courses would be likely to help a great number of adults and out-of-school youth in their present occupations, and prepare them for future opportunities. Negroes will be employed in other occupations providing they have acquired the necessary training and experience.

2916. BOSWORTH, CLAUD AARON. *A Job Opportunity Survey of the Grand Haven Community.* M. A., University of Michigan, 1942. 196 p.

A complete occupational inventory of the Grand Haven area. The material and information was gathered to be used in connection with the vocational guidance program and in establishing an overall vocational education program to fit the needs of the community.

2917. BRADFORD, FRANK PRUETT (Masters), *Survey of the Industrial Occupational Opportunities in Muscogee, Georgia, for Graduates of the Jordan Vocational High School.* Alabama Polytechnic Institute, 1940.

2918. BROWN, MILTON T. *Occupational Studies of Selected Skilled Trades in the Philadelphia Area.* Ed. D., University of Pennsylvania, 1948. 158 p.

A study of trends and occupational outlook in 50 selected skilled trades for the Philadelphia area. Local and national trends are studied from 1910 to 1948.

2919. CLINE, WILLIAM F. (Masters). *A Survey to Determine the Needs for Industrial Education in Wood County, West Virginia.* Ohio University, 1937.

2920. COLE, DARRELL. *A Study of Recent Trends in Industry and Their Influence on the Industrial Arts Curriculum in the Public Schools.* M. S., 1951, Bowling Green State University. 70 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To determine which of the new materials and processes now used by industry should be included in industrial arts.

Source of Data: Data were secured by visitations to industrial establishments in northwest Ohio, from trade magazines, bulletins, and printed courses of study in industrial arts.

Findings and Conclusions: Industrial arts courses in plastics are not making full use of potentials. Industrial arts is not making full use of the new materials available in woodworking. At present, electronics is offered as a unit of electricity. Drawing standards and practices in industrial arts and industry differ.

2921. COLE, GEORGE MARTIN. *A Study of Duval County's Industries for Enrichment of the Industrial Arts Program.* M. Ed., 1952, University of Florida. 73 p. Library, University of Florida, Gainesville.

Purpose: To show that the industries of the county are important potential laboratories of learning and that students may get consumer, social, and occupational knowledge from studying local industries.

Source of Data: Data were obtained from the Research Division, Florida Chamber of Commerce, The Bureau of Economic and Business Research, University of Florida, a cigar company, and numerous visitations to other companies.

Findings and Conclusions: The function of industrial arts is to provide general education on the secondary level. There should be basic courses in industrial arts for those with no previous experience followed by specialized courses. Industrial arts has been given the crucial mission of meeting many of the individual "needs" in an industrial society.

2922. CONNOR, DANIEL J. (Masters). *A Survey to Determine the Establishment of an Industrial Arts Course in a High School.* Massachusetts State College, 1938. 90 p.

2923. COONEY, JACK E. *Trade and Industrial Education in the Columbia Basin Area.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 93 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the trade and industrial education needs in the Columbia Basin area.

Source of Data: Data were obtained from a review of literature and from personal interviews.

Findings and Conclusions: The Tri-City area had experienced an abnormal growth in population due to large construction projects. Employment on these projects had experienced sharp cutbacks and high peaks. School enrollments continually increased from 1942 to 1951. Long term planning in this phase of the Columbia Basin development program is expected to aid in orderly expansion.

2924. CORLETT, DONALD FREDERICK. *An Analysis of the Required Courses in the Industrial Arts Technical Option Curriculum at North Carolina State College in the Light of Industrial Job Requirements.* M. Ed., 1955, North Carolina State College of Agriculture and Engineering. 57 p. Library, North Carolina State College of Agriculture and Engineering, Raleigh.

Purpose: To ascertain whether the Industrial Arts Technical Option Curriculum at North Carolina State College was preparing its graduates for employment in responsible positions in industry.

Source of Data: Data were obtained from an analysis of job descriptions covering responsible positions in the areas of production, maintenance, personnel, safety, and sales. Course outlines were screened to see if the analysis requirements were met.

Findings and Conclusions: The requirements which should be covered by the required courses were: communication principles, principles of human behavior, and industrial methods, materials, tools, and products. Recommendations were made for curriculum and elective revision.

2925. DAVIS, EDWARD S. (M. A.). *Occupations and Secondary School Curricula of the Northwest.* Colorado State College of Education, 1932. 91 p.

A study showing major occupations of the Northwest and comparing these occupations with curricula of the secondary schools.

2926. DICK, DELBERT CLIFFORD (M. S.). *Employer Interest in and Attitude toward Industrial Arts in Maryville, Missouri.* Iowa State College, 1949. 22 p.

A survey of employers in the Maryville public school district to determine the employers' interest in and attitude toward industrial arts. Recommendations for improving the program are offered.

2927. DILLER, ARTHUR D. *A Survey to Determine How Adequately the Industrial Education Program at DeVilbiss High School, Toledo, Ohio, Is Meeting the Needs of Toledo Industries.* M. A., Univerity of Michigan, 1937. 42 p.

A study to show what trades are open to high school graduates; what training in the trades should be emphasized, what personality traits are most desirable, what academic subjects should be stressed, and what extra-curricular activities are most helpful. Data were obtained from a survey of personnel managers in Toledo industries.

2928. DORR, OTTO J. (M. S.) *An Occupational Survey.* Colorado Agricultural & Mechanical College, 1930. 188 p.

A survey of ninety-one industries in Fond du Lac, Wisconsin. Charts describe each industry with emphasis on the training and placement opportunities.

2929. EATON, ARTHUR CHARLES (M. S.). *Industrial Arts in the Homes of a Community.* Cornell University, 1940. 49 p.

A study to determine if a current course of study in industrial arts in a particular community is suitable to the needs of that community.

2930. EDWARDS HAMP S. (M. A.) *A Vocational Education Program for the Lower Rio Grande Valley of Texas, Based upon Needs.* Colorado Agricultural & Mechanical College, 1940. 219 p.

An investigation of the vocational education needs in the lower Rio Grande Valley, Texas.

2931. EISENHARDT, GEORGE H. (Masters). *A Study to Determine the Trade Skills and Understandings Necessary for Original Employment in the Field of Automobile Mechanics.* University of Pennsylvania, c. 1935–47.

2932. ELIZER, JAMES T. *A Vocational Trade and Industrial Program for Haywood County High School, Brownsville, Tennessee.* M. S., 1953, University of Tennessee. 49 p. Library, University of Tennessee, Knoxville.

Purpose: To ascertain the need for a trade and industrial education program for Haywood County High School, Brownsville, Tennessee.

Source of Data: Data were secured by interviews with employers.

Findings and Conclusions: The Haywood County High School was in need of a trade and industrial education program. The diversified occupations program would best meet these needs.

2933. FETTY, HOMER D. (M. S.). *A Survey of the Needs in Long Beach, California, for School Instruction in the Automotive Trades.* University of Southern California, 1939. 94 p.

A study to survey prospective employers' viewpoints to determine the types of training most advantageous in the automobile trade.

2934. FRASIER, PERRY G. (Masters). *An Analysis of the Needs for Vocational Education of the Five Basic Building Trades in Iowa.* Iowa State College, 1934.

2935. GIBSON, W. W. (M. S.). *The Development of Instructional Materials Concerning House Planning for Use in Industrial Arts Departments.* A & M College of Texas, 1940. 87 p.

A survey of housing conditions and home and community planning materials from 1932 to 1940.

2936. GLEASON, HELEN. *Analyses of Occupations Open to Women in the Grand Rapids Area.* M. A., University of Michigan, 1946. 94 p.

Gives brief outline of nature of the work, advantages and disadvantages, qualifications and training needed, possible lines of promotion or other occupations to which this one may lead, labor field, social status and the like. A validated reference list is given for each occupation surveyed.

2937. GRANT, CATHERINE (Masters). *A Study to Determine the Vocational Industrial Education Needs for Women in Philadelphia.* University of Pennsylvania, c. 1935–47.

2938. GREER, WILLIAM D. (Masters). *To Determine Whether There Is Parallel Advancement in Industrial Arts and Industry in the State of Texas.* North Texas State Teachers College, 1944.

2939. HARTMANN, RICHARD W. (Masters). *A Study to Determine the Employment Opportunities in the Field of Applied Electricity in Philadelphia and the Surrounding Area.* University of Pennsylvania, c. 1935–47.

2940. HENKE, RAYMOND, W. *A Community Occupational Survey of Marinette, Wisconsin and Menominee, Wisconsin.* M. S., 1952, Stout State College. 84 p. Library, Stout State College, Menomenee, Wisconsin.

Purpose: To ascertain whether the school's program is meeting community needs, and if not, how it can be revised to meet such needs.

Source of Data: Data were secured from a review of literature and an interview schedule.

Findings and Conclusions: Openings existed in several trade areas both in the construction and industrial fields. Courses in addition to the basic ones now offered should be included in the training of apprentices and in preparation for the occupations. Courses for upgrading journeymen are desired and training for replacements in industry is justifiable.

2941. HERON, PERCY H. *Certain Aspects of Vocational and Industrial Arts Education Relative to the Public Schools of San Diego, California.* M. A., Claremont College, 1938. 153 p.

A detailed analysis of the vocational educational possibilities as represented by the industrial employment conditions in the city of San Diego in the year of 1938, and a careful and complete study of all aspects of the problem of industrial arts and vocational education in the San Diego schools.

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2942. HOROWITZ, IRVING LEWIS (Ph. D.). *The Metal Machining Trades in Philadelphia—An Occupational Survey.* University of Pennsylvania, 1939. 129 p.

A survey of the metal working industries to determine the number and nature of wage earning occupations in Philadelphia which require some degree of machine shop training. Data were assembled between October 1936 and August 1937.

2943. HUFFAKER, HERBERT H. (M. S.). *An Occupational Survey of Galveston, Texas.* A & M College of Texas, 1941. 60 p.

A study of the occupational opportunities and requirements in Galveston and the occupational activities of its high school graduates. Suggestions for needed training programs are offered.

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2944. JETTER, EVERETT VAIL (Ph. D.). *A Survey of Morris County, New Jersey, for the Purposes of Secondary Vocational Education.* New York University, 1932. 132 p.

An analysis of the social, economic, and geographic conditions of the county. Employment conditions, pupil population, and legal considerations were analyzed in connection with establishing a county vocational school.

2945. JOHNSON, JOE S. (M. A.). *An Occupational Survey of Youth Leaving the Booker T. Washington School, Cushing, Oklahoma, during 1931-1941, and Their Evaluation of Their High School Education.* Colorado State College of Education, 1942. 70 p.

An evaluation of the present vocational educational program based on interviews of graduates, students, and employers. Recommendations for improving the program are offered.

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2946. KAFFER, FRED C. (Ed. D.). *Syracuse Occupational Survey, Syracuse, New York.* New York University School of Education, 1941. 293 p.

A survey of the manufacturing industries, distributive occupations, building trades, clerical occupations, transportation, and communications in Syracuse for the period 1937–39. Occupational status and trends of vocational opportunities are included.

2947. KISTLER, ELTON E. (Masters). *A Survey of Occupational Opportunities in Kenton, Ohio, with Implications for Industrial Arts.* Ohio State University, 1939.

2948. KNOEBEL, ROBERT M. (M. S.). *Sunbury as a Location for Area Vocational Training.* Pennsylvania State College, 1948. 39 p.

A survey of the facts bearing on the desirability of establishing a program of area vocational training at Sunbury, Pennsylvania.

2949. KOLITZ, HARRY HIRSH (M. A.). *Industrial Arts Resources Pertinent to the Public Schools of Florida.* University of Florida, 1948. 104 p.

A survey of the undeveloped natural resources of Florida and how the industrial arts may stimulate the development of a new industry by utilizing these resources. Study of and co-operation with present industrial establishments is recommended.

2950. LEADBETTER, JOSEPH C. *Jr.* *Industrial Resources, Industries, and Potentialities of the Seventh Congressional District of Texas.* M. A., 1953, Sam Houston State Teachers College. 183 p. Library, Sam Houston State Teachers College, Huntsville, Tex.

Purpose: To examine and describe the industrial resources and potentialities of the district, and to point out their implication for industrial arts education.

Source of Data: Data were secured from library books, Chambers of Commerce, Bureau of Business Research, personal observation, and field trips to various places in the district.

Findings and Conclusions: The following minerals are found in the Seventh Congressional District: silica, iron ore, mica, lignite, quartzite, strontium, salt, koelin, and mineral water. Most of these are not being utilized to the fullest extent. There are few industries in the district that are dependent on other areas for raw materials.

2951. LEWIS, JOHN W. *A study of Programs, Graduates, and Employment Opportunities for the Division of Technology, Hampton Institute.* M. Ed., 1953, Wayne University. 53 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To explore objectively the job opportunities for Hampton Institute graduates in trade and industrial arts education, and especially teachers of auto-diesel mechanics, and to ascertain the relationship of the programs in secondary and special schools to existing and potential job opportunities for these graduates.

Source of Data: Data were obtained from officials of the College, records on file, and from a survey.

Findings and Conclusions: From time to time during the history of the Division, changes and revisions have taken place which have materially affected graduate numbers and ultimately graduate placement. There was evidence that the College should be keenly aware of what the public education programs are, the supply and demand for vocational teachers, and the vocational skills that are taught.

2952. LINDELL, CLEMENS B. (M. A.). *Student and Community Needs as a Basis for a Reorganization of the Industrial Arts Curriculum of the Dixon, Illinois, High School.* Colorado State College of Education, 1946. 63 p.

An investigation to find how industrial arts might be made more functional to the community of Dixon, Illinois.

2953. LINEBACK, HUGH. *Employment Opportunities for Radio Technicians in Oklahoma.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 69 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the opportunities for radio technicians in the State of Oklahoma. To obtain industry's suggestions for a training program. To acquaint industry with the type of training offered by Oklahoma Agricultural and Mechanical College.

Source of Data: Questionnaires were mailed out to 800 individuals and companies who had interests in radio or electronic work.

Findings and Conclusions: A need exists for special training as provided by an intensive two-year technical training course. The salaries for jobs requiring special training were above those which required only a high school education. Government operator's licenses are needed for all technical jobs in broadcasting. The demand for short courses is greatest in radio repairing. There is a need for the training of radio technicians at a level not aimed at purely engineering objectives. High School education alone is seldom adequate for technical work in radio.

2954. LOBECK, WILLIAM EARL. *A Study of the Opportunities for Employment in Industry in the Norfolk Area of Virginia.* M. S., 1953, Virginia Polytechnic Institute. 82 p. Library, Virginia Polytechnic Institute, Blacksburg.

Purpose: To ascertain the nature and extent of employment opportunities for those trained in the trades, crafts, and semi-skilled trades in the Norfolk area.

Source of Data: Data were obtained through interviews with representatives of industrial firms in the area.

Findings and Conclusions: More industrial workers were employed in governmental installations than in any other employing group, with building trades second. Sixty (60) per cent of the governmental installations group, 40 per cent of the building trades group, and seven per cent of the manufacturing group had approved apprentice training programs. Of the basic machine and tool experiences now being taught most firms reported the experiences to be beneficial to in-coming employees. More related and technical information should be included in the high school curriculum.

2955. LOCKERT, AEOLIAN EDWARD. *Job Requirements and Employment Opportunities For Skilled and Semi-Skilled Employees in Fifty-Two Selected Industries in Nashville, Tennessee.* M. S., 1955, Tennessee Agricultural and Mechanical University. 80 p. Library, Tennessee Agricultural and Mechanical University, Nashville.

Purpose: To compile information about job requirements and employment opportunities for skilled and semi-skilled workers in selected manufacturing industries of Nashville, Tennessee.

Source of Data: Data were secured by a check list scored by the investigator during interviews with representatives of each industry surveyed.

Findings and Conclusions: In the industries studied, approximately fifty per cent were skilled workers and thirty-four per cent were semi-skilled. Many of the industries had no educational requirements for semi-skilled employees. The high school subjects which industries felt most beneficial were: algebra, business arithmetic, English, industrial arts, plane geometry and vocational-industrial education.

2956. LOMBARDI, CESARO LOUIS. *A Survey of Northeastern Oklahoma Craftsmen and Their Work.* M. S., 1953, University of Tennessee. 84 p. Library, University of Tennessee, Knoxville.

Purpose: To assemble information on craftsmen and their work in nineteen counties in Northeastern Oklahoma.

Source of Data: Data were secured through questionnaires sent to craftsmen and crafts teachers.

Findings and Conclusions: There are thirty-two crafts teachers in Northeastern Oklahoma with varied experience, talent, training and purposes. Weaving, woodworking and pottery, in the order named, are the most popular crafts. Of the group studied, 15 per cent use craftswork as a means of support, 70 per cent supplement their income through craftswork, and many participate in it as a hobby.

2957. McCALIB, BILL (Masters). *Vocational Education Possibilities for Carter County, Oklahoma.* Oklahoma A & M College, 1938.

2958. McKINNEY, WOODROW WILLIAM (M. S.). *Integrating an Industrial Arts Programs in Cleveland, Tennessee.* University of Tennessee, 1941.

An analytical description of the development and status of industrial arts and vocational education in Cleveland, Tennessee. It includes a survey of industrial firms to determine the need for an integrated program of industrial arts and vocational education.

2959. MERRILL, HARRY A. (M. S.). *A Survey of Training Needs of Electricians in the Paper Mill at Niagara, Wisconsin.* The Stout Institute, 1948. 32 p.

A survey of the electricians in a local paper mill in Niagara, Wisconsin, to determine the need for a supervised in-service trade training program.

2960. MILLER, CHARLES C. (M. S.). *A Comparison of the Training Required for Draftsmen in the Industries of East Chicago, Indiana, With the Training Now Offered in the East Chicago High Schools.* Iowa State College, 1931. 66 p.

A study based on interviews with drafting room foremen in forty-three industrial plants of East Chicago to determine the need for draftsmen, the kind of draftsmen wanted, personal qualifications preferred, weakness of those previously employed skills and techniques desired, essential knowledge required, and the particular kind of drafting work which is stressed by industries.

2961. MUELLER, LEONARD WILLIAM. *Meeting the Needs of Industry in Education Through an Industrial Course of Study in Streator High School.* M. S., 1949, Illinois State Normal University. 62 p. Library, Illinois State Normal University, Normal.

Purpose: To meet the needs of the students at the Streator, Illinois Township High school who will go into one of the local factories to work after they leave school.

Source of Data: Data were obtained by the interview-questionnaire technique. Personnel directors of eight of the largest industrial concerns in Streator took part in the study.

Findings and Conclusions: The following subject-matter fields were found to be essential or desirable; reading, United States history, arithmetic, economics, civics, geography, speech, general science, mechanical drawing, metal shop and woodwork. Behavior patterns found to be essential or desirable were: ability to get along with fellow workers, ability to take and issue orders, ability to get along with or husband, personal ambition, a worthwhile avocation, respect for the rights for others, realization of the importance of safety measures, promptness on the job, cooperation with associates, temperance in drink, reliability, willingness to accept responsibility, interest in own work and the work on one's group, and the desire to work.

2962. MUTCHMOR, SHIRLEY McLAUGHLIN (M. S.). *A Program of Trade and Industrial Training for Winnipeg, Manitoba, Canada.* Colorado Agricultural & Mechanical College, 1939. 240 p.

A study of the vocational education needs of Manitoba with emphasis on the number of people employed in Winnipeg, the present training of young workers, and employment opportunities available. Recommendations for changes are made.

2963. NASON, LEIGH M. (M. A.). *A Study of Certain Manufacturing Industries of the Kanawha Valley.* Ohio State University, 1940. 54 p.

A study of the coal mining, chemical, glass, and metal industries in this selected area of West Virginia. Current employment policies, types of workers employed, and methods of training new employees are considered as a basis for improving the effectiveness of vocational education and placement.

2964. NAVE, CHARLES HOBERT (M. S.). *The Schools and Industries of Kingsport, Tennessee in Relation to Vocational Training.* University of Tennessee, 1933. 74 p.

A study conducted in 1932 which traces the development and current status of the public school system and the vocational trade and industrial classes in operation. It includes a survey of the local industrial plants as they are related to or served by the program of vocational education.

2965. NEUGART, ARTHUR RAYMOND (M. S.). *A Survey of Occupations in Albany, Oregon, in Relation to the Industrial Arts Program.* Oregon State College, 1941. 92 p.

Formulates a survey approach in which the interests of parents (as employed adults), and business and industrial leaders (as employers) voice ideas and suggestions for the improvement of school work—particularly in the industrial arts area of secondary education.

2966. NORTON, JOHN P. (Masters). *Vocational High School Needs for Schenectady.* New York State College for Teachers, Albany, 1940.

2967. PANNELL, HERMAN CLAY (M. A.). *Vocational Opportunities in New Mexico.* University of Colorado, 1934. 70 p.

A study of vocational opportunities of New Mexico for vocational guidance counselors, based on potential job assignments and openings.

2968. PARKER, HUBERT L. *The Need for Industrial Education for Negroes in the State of Oklahoma.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 78 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the need for industrial education for Negroes in the State of Oklahoma.

Source of Data: Data were secured through publications and a questionnaire.

Findings and Conclusions: An industrial school for Negroes in the State of Oklahoma would be welcomed by most employers to aid Negroes in developing good work habits, and make it possible for more Negroes to secure employment in skilled and technical jobs.

2969. PARKER, RALPH WALTON (M. S.). *A Survey of Certain Industrial and Agricultural Activities of the State of Oregon with Particular Reference to the Possible Influence on the Practical Arts Program of Oregon Public Schools.* Oregon State College, 1931. 49 p.

An attempt to discover the relationship of the practical arts training of high schools to the industrial and agricultural work of the selected communities. Particular attention is given to co-operative apprenticeship training.

2970. PHILLIPS, AUGUSTUS C. (M. A.). *The Industrial Opportunities of Negroes in Selected Cities.* University of Minnesota, 1936. 136 p.

A study of occupational shifts among Negro workers in ten southern cities, 1920–1930, as to occupational groups and social and economic classifications. Data may be used in planning school programs.

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2971. PHILLIPS, AUGUSTUS C. (Ph. D.). *Industrial Arts for Negroes in the South Atlantic Region.* Ohio State University, 1941. 209 p.

A study which investigates the population and occupational shifts among Negro workers in the South Atlantic regions in an effort to plan a program of industrial education for these Negroes in keeping with the changes in their economic and social life.

2972. RUNG, THOMAS J. (M. S.). *An Analytical Survey of Industrial and Home Service Occupations for the Purpose of Ascertaining Vocational Curricular Needs in the Allentown School District.* Pennsylvania State College, 1940. 108 p.

A vocational survey which includes an industrial survey, a study of home service occupations and a study of the educational background of the youth of ages eighteen to twenty-five enrolled in the National Youth Administration (N. Y. A.) of Allentown.

2973. SAMOTIN, M. E. (Masters). *A Study to Determine the Employment Opportunities in the Philadelphia Area, for Graduates of a Vocational Radio Construction Curriculum.* University of Pennsylvania, c. 1935–47.

2974. SARGENT, CLIFFORD H. *A Trade Preparatory Program in Industrial Chemistry for Davidson County, Tennessee.* M. S., 1949, The University of Tennessee. 99 p. Library, University of Tennessee, Knoxville.

Purpose: To determine the need for chemical technicians in the Davidson County area. To give an outline for a 3-year course in Industrial Chemistry on the secondary level to fulfill these needs.

Source of Data: An investigation of the provisions of other States for such courses was made. The county and city school superintendents and principals were individually contacted, and suggestions noted. The need for trained chemists was ascertained by a survey of the chemical plants in Davidson County. A job analysis was prepared and confirmed by personal visitation resulting in a listing of the operations performed by Industrial Chemists in the area.

Findings and Conclusions: Of the total of the 32 firms employing chemical technicians in the area, 30 indicated a need for chemical training on a pre-employment basis. A list of 48 items including 38 basic operations, together with fundamental technical information units was developed as a result of the study. This list of items was rearranged and checked with a proposed course outline which would make possible the inclusion of the fundamental operations in a 3-year course on a pre-employment basis. A description was given of the proposed course as it was operated at Hume-Fogg Technical and Vocational High School in Nashville beginning in 1945–46 to 1948–49, inclusive. Every one of the graduates of the 3-year course has secured employment in some phase of chemical technician work. Recommendation was made that additional follow-up surveys be conducted to determine possible course revisions and variations to meet new situations.

2975. SATTERLEY, WILLIAM OSMOND. *A Study of the Opportunities and Requirements for Shipmaster on the Great Lakes.* M. A., University of Michigan, 1939. 54 p.

A study setting forth the requirements and opportunities for shipmasters on the Great Lakes. Suggestions are made for publication in pamphlet form, and the extension of this type of study to other positions, such as coal-passer, engineer, and fireman.

2976. SCHNEIDER, EDWIN R. *Job Opportunity Survey of the Major Industries in Oneida, New York,* M. S. in Ed., 1950, Cornell University. 44 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Purpose: To give a comprehensive picture of the employment situation within major industries of Oneida, New York.

Source of Data: This study is based on the occupational information and the occupational and educational experience preferences received from the Oneida industrial employers as of July 1, 1950. Data requested on the questionnaire were: Number of male and female workers employed; specific occupations; number of employees hired during the last 12 months; approximate annual labor turnover in each occupation; and the employers' preferences as to: Minimum age, actual work experience, minimum education, and public school vocational training for their employees in each occupation.

Findings and Conclusions: The local industrial establishments are sufficiently large enough to absorb a greater percentage of the local high school boys and girls who seek employment. Occupations which offer the greatest opportunity for employment are the office clerical, semi-skilled and unskilled jobs. The professional, semi-professional, and supervisory occupations which require higher education and longer work experience periods offer limited opportunity to high school graduates.

2977. SCHWARTZ, JACK (M. Ed.). ***Comparison of Requirements in Two Hundred Vocations 1929–1938.*** **Temple University, 1938. 98 p.**

A survey of employers to determine the employment requirements in 1924 and 1928 of two hundred occupations in Philadelphia.

2978. SCOTT, SAMUEL THOMAS. ***An Occupational Analysis of Fifteen Common Occupations Among Negro Men in San Antonio, Texas, and Vicinity.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1942. 71 p.**

An occupational study of 15 most common occupations for Negroes in San Antonio.

2979. SMELSER, REX H. (Masters). ***An Occupational Survey of Alexandria, Louisiana.*** **Louisiana State University, 1939.**

2980. SMITH, MERCY DELORA (*Mrs.*) (M.A.). ***Occupational Analysis and Vocational Survey of Beauty Shop Work in Indianapolis.*** **Indiana University, 1935. 85 p.**

This study, made during the 1934–35 school year, is a job analysis of the work of the beauty shop operator in Indianapolis, Indiana. It includes a survey of the beauty shops in the city, showing conditions of the trade. Data were collected from over one hundred beauty shops.

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2981. SNITZ, RUBEN HERMAN (Ph. D.). ***An Analysis of the Sheet-Metal Worker's Trade and a Curriculum for the Training of Teachers of Sheet-Metal Work in Industrial Arts Courses.*** **Indiana University, 1931. 251 p.**

The specific problem of this study is to make an analysis of the sheet-metal worker's trade which is to be used as the basis for a curriculum for the training of teachers of sheet-metal work.

2982. SNOOK, LORING F. (M. S.). ***A Survey to Determine the Need For a Distributive and Trade and Industrial Vocational Education Program in Ames, Iowa.*** **Iowa State College, 1941. 57 p.**

A survey of the business and industrial section of Ames, Iowa, to determine the need, if any, for an industrial training program.

2983. STEIMLE, JOHN W. ***Industrial Education at Faribault, Minnesota,*** **M. A., University of Minnesota, 1946.**

A local survey of industries and training facilities as a basis for a program of industrial arts and vocational industrial education in a city of 14,000 inhabitants.

2984. STEPHENS, CARL EDWARD (Masters). ***Schools and Industries of Knoxville, Tennessee, in Relation to Trade Education.*** **University of Tennessee, 1936.**

2985. STEPHENSON, JOHN L. (M. A.) ***Vocational Survey of Greenwood Indiana.*** **Indiana University, 1930. 124 p.**

This study includes data on every gainful occupation engaged in by the residents of Greenwood, Indiana for the school year 1929–1930. The need for an extension of the vocational training program is revealed.

2986. ST. GEORGE, R. EDWARD (Masters). ***An Analysis of the Filling Station Business Special Regard to the Operator's Duties and Responsibilities with Recommendations for Training.*** **University of Alabama, 1940. 120 p.**

2987. TAYLOR, CYRUS B. (M. S.). ***Home Planning as an Industrial Arts Activity.*** **Iowa State College, 1940. 100 p.**

A survey of what home-owners and building experts thought people should know about planning, building, and equipping a home.

2988. **TERRELL, WENDELL P., *Sr.*** (M. S.). *A Study of the Employment of the Graduates of Ten Negro High Schools of Texas.* Colorado Agricultural & Mechanical College, 1938. 79 p.

An occupational survey of the graduates of Negro high schools in eight cities in Texas, to determine the vocational education needs of future students.

2989. **THOMPSON, CHARLES JASPER** (Masters). *Survey of Domestic Needs in Electricity.* Kansas State Teachers College, 1930.

2990. **VAN HORN, PAUL J.** (M. S.). *The Manipulative Performances and Related Information to be Taught in an Industrial Arts Course in Auto Mechanics.* Colorado Agricultural & Mechanical College, 1938. 167 p.

An analysis of service and repair jobs to determine manipulative operations and related information involved in each job.

2991. **VAN SKIVER, RAYMOND J.** *Vocational Activities of the Industrial Arts Teacher in the State of Kansas.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 52 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the community activities and the supplementary employment of industrial arts teachers in Kansas.

Source of Data: Data were obtained from a questionnaire mailed to the industrial arts teachers of Kansas.

Findings and Conclusions: The teachers were failing to take an active part in community activities. One-half of the teachers felt that it was necessary to do additional work to supplement their present teaching salary.

2992. **WALSH, JOHN P.** (M. S. in Ed.). *A Survey of Occupations in the Glove Manufacturing Industry of Fulton County, New York and a Community Occupational Survey of the City of Gloversville, New York for the Planning of Vocational Education in the Public Schools.* Cornell University, 1947. 66 p.

A survey of the glove industry of Fulton County, New York and an occupational survey of the city of Gloversville with a presentation of conclusions and recommendations for the improvement of vocational education in Gloversville, New York.

2993. **WHEELER, WESLEY EUGENE.** *Evaluation by the Printing Industry of its Needs in Relation to the Printing School Graduate.* M. S., 1951, Kansas State Teachers College. 75 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To learn the types of pre-employment training printing employers in Kansas want their employees to have.

Source of Data: Data were obtained from questionnaires sent to employers in the printing industry.

Findings and Conclusions: The ideal employee chosen by Kansas printers is 26 years old, married, American descent, attends church, and is a high school graduate. He will work in an open shop for approximately $36.18 per week with five fellow employees. His related education should include paper, inks, design, and proofreading. He should be trained to operate the linotype, platen press, cylinder press, router, folder, paper cutter, perforator, stitcher, and electric saw. He should be intelligent, loyal, honest, stable, sober, cooperative, have the right attitude toward work and people, be able to take responsibility, and take part in community activities.

2994. **WHITE, FREDERICK** (M. A.). *Trends in Employment and Vocational Education in California.* Stanford University, 1933. 88 p.

A survey of the extent to which the high school program in California has been influenced by trends towards industrialism up to 1934.

Teacher Education

General

2995. ALLEN, GOVE L. (M. A.). *The Status of the Teacher of Industrial Arts in Arizona, 1948.* Colorado State College of Education, 1948. 136 p.

The professional education of industrial arts teachers in Arizona public schools is reviewed. The present status of industrial arts and specific teaching problems are also reported.

2996. ALLEN, J. G. (M. S.) *A Study of the Status of Shop Teachers in the All Day Unit Trade School in the State of Pennsylvania.* Pennsylvania State College, 1930. 35 p.

Investigates the status of trade and industrial teachers in order to obtain information that would facilitate the establishment of teacher training centers where these teachers might enroll in professional courses. It evaluates the various forms of industrial education as authorized under the Smith-Hughes Act.

2997. ALLISON, FLOYD C. (M. S.). *Machine Drafting Inventories for Day Trade and Industrial Trade Extension and Defense Training Classes.* Wayne University, 1943. 52 p.

An analysis of the problem of classifying students entering courses in trade drafting and an appraisal of their work, by means of inventories, as instruction progresses. Consideration is given to machine tool operations and their application to drafting.

2998. ARCHER, FLORA ALICE (M. A.) *A unit of the Oil Industry.* George Peabody College, 1936. 109 p.

A study of the petroleum industry giving its historical background, the development of the oil industry in Oklahoma, and the modern uses of petroleum. A suggested unit of study for teacher preparation in this subject is included.

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2999. ASHLEY, LAWRENCE F. (Doctors). *Industrial Arts Education in Teacher Education.* Ohio State University, 1936.

3000. BAAB, CLARENCE T. (M. A.). *The Status of the Teacher of Industrial Arts Education in Colorado.* Colorado State College of Education, 1932. 95 p.

A personnel study of industrial arts teachers in Colorado in which average practices and characteristics were combined to represent a "typical" teacher.

3001. BACON, KATHERINE (Masters). *The Relationship of Interest to Vocational Fitness.* University of Tennessee, 1941.

3002. BAECHLE, EDNA M. (M. Ed.). *A Study of Philadelphia Teacher Difficulties in Industrial Arts, Grades 5 and 6.* Temple University, 1931. 33 p.

Questionnaires were submitted to seventy-two industrial arts teachers and six supervisors in Philadelphia in an effort to point up the teacher difficulties regarding discipline, planning, and acquiring skills preliminary to teaching zinc etching, linoleum block printing, and rebinding books.

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3003. BAKER, ALFRED ELMORE (Ed. D.). *A Survey and Analysis of Senior High School Practical and Applied Arts Offerings to Determine the Content Which May Be Utilized in Pre-Employment Trade Education.* University of California, Berkeley, 1943. 396 p.

A study showing the relationship between high school courses and course selection in trade schools. It indicates the advantages of industrial arts training for vocational students and desirable subject work in other fields.

3004. BARNES, CHESTER H. (Masters). *A Study to Determine the Number of Vocational Industrial Teachers Who Have Left Teaching in Pennsylvania During the Last Five Years to Return to Industry.* University of Pennsylvania, C. 1935–47.

3005. BASCHLE, EDNA M. (Masters). *A Study of Philadelphia Teacher Difficulties in Industrial Arts.* Temple University, 1931.

3006. BEELER, FRANCES ELIZABETH (M. A.). *Opinions Regarding the Entrance of Women in Industrial Arts Education.* George Peabody College, 1938. 72 p.

A comparative study of the place of women in the field of teaching industrial arts, based on questionnaires supplemented by personal letters regarding this matter.

3007. BELANGER, AURILIAN J. (M. A.). *Teaching Problems and Class Room Difficulties (Industrial Arts).* University of Minnesota, 1941. 111 p.

A description of the day-to-day problems and difficulties of selected industrial arts teachers of Minnesota, showing the degree to which college instruction and experience factors affect them.

3008. BENSON, LLOYD M. (M. S.). *A Determination of the Educational Needs of Printing Instructors in Five States of the Middle West.* Iowa State College, 1934. 46 p.

A survey of teacher training needs of printing instructors in five states of the Middle West. The analysis lists such needs as were received on questionnaires sent to instructors.

◆ **3009. BING, KENNETH L. (Ed. D.).** *Success of Students Presenting Practical Arts Credit for Entrance to the University of Missouri.* University of Missouri, 1941. 222 p.

A study of practical arts and college admission officials. The relative value of practical arts vs. academic subjects as preparation for college are compared.

3010. BINGHAM, HAROLD C. (M. Ed.). *A Study of the Teaching of Related Information to Woodwork in Grades Seven and Eight in the Schools of Maine, New Hampshire, and Vermont.* Pennsylvania State College, 1937. 64 p.

Investigates methods of teaching related information, the school library facilities, related information subject matter, and procedures used in measuring pupil achievement in grades seven and eight in the schools of Maine, New Hampshire, and Vermont.

3011. BOLLE, HARRY (Masters). *A Study of the Qualifications and Activities of High School Teachers in Industrial Arts in the State of Illinois.* Northwestern University, 1932.

3012. BOYD, ERMON EUGENE (M. S.). *Present Practice in Making Industrial Arts Courses of Study.* Oklahoma A. & M. College, 1935. 84 p.

A review of the status of courses of study in eleven states, pointing out needs for printed courses and state supervision to improve their use. Courses of study in use in twenty-two cities in eleven states in 1935 are examined and compared.

3013. BOYER, HOMER (M. A.). *Problems in the Teaching of Industrial Arts in Colorado as Reported by Instructors and Administrators.* Colorado State College of Education, 1939. 91 p.

A study describing the teaching problems of industrial arts instructors and the problems and opinions of school administrators toward industrial arts in Colorado.

3014. BRADSTREET, CECIL B. (Masters). *A Unit of Work on Industrial Arts.* Rhode Island College of Education, 1945.

3015. BREWER, MARGARET (Masters). *Non-Collegiate Trade and Vocational Education.* Southern Methodist University, 1939.

3016. BROOKS, DONALD BERESFORD (M. A.). *An Analysis of the Proofreading Abilities of Junior High School Print Shop Students.* University of Southern California, 1934. 90 p.

A study of the nature of the proofreading operation and of the various types of abilities necessary to perform it satisfactorily in all its phases. A short history of proofreading and printing, discussion of psychology of reading, classification of various types of abilities, and detailing of experiments with students in junior high school print shops are included.

3017. BROTT, EVERETT MALCOLM. *Orientation of the New Industrial Arts Teacher.* M. A., 1955, Chico State College. 50 p. Library, Chico State College, Chico, California.

Purposes: To ascertain the general orientation procedures that were offered the beginning industrial arts teachers who entered teaching after graduation from Chico State College in 1953 and 1954.

Source of Data: Data were secured through a questionnaire sent to the thirty-two graduates in industrial arts in 1953–54 at Chico State College.

Findings and Conclusions: This study reveals trends in regard to general teacher orientation as well as the new industrial arts teachers' orientation to the shop. Significant findings are noted in regard to the school personnels' contribution to this orientation.

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3018. BROWN, ROBERT DEAN. ***Industrial Arts Competencies Needed by Elementary Teachers.*** **Ph. D., 1955, University of Minnesota. 329 p. Graduate School, University of Minnesota, Minneapolis.***

Purpose: To ascertain as accurately as possible the industrial arts competencies which are needed by elementary teachers.

Source of Data: Data were gathered from a selected sample of St. Paul, Minnesota, elementary teachers through the use of the interview—re-interview technique and from random samples of Minnesota graded school and ungraded school elementary teachers through the use of a mailed inventory check-list. The t-test of significance and Bartlett's test of the homogeneity of variance were used in the analysis of the data.

Findings and Conclusions: Elementary teachers should develop specific competencies within each of three broad industrial arts areas. The areas are: woodwork, the graphic arts, and the crafts. Specific skills and knowledges to be learned in each area are detailed in the thesis. Each elementary teacher should possess a great deal of general industrial arts knowledge. She should know the objectives of elementary industrial arts, the ways in which the program can best be carried on, how industrial arts activities can be integrated with the work of the teaching unit, and how to demonstrate manipulative skills in such a way that learning is facilitated. Each elementary teacher should be familiar with a wide variety of industrial arts activities which can be profitably carried on at the elementary level, and she should know about numerous specific activities included within each general type.

3019. BRUNDAGE, JOE R. (M. A.). ***The Personnel of the Teacher of Industrial Education in Arizona.*** **Colorado State College of Education, 1933. 107 p.**

A personnel study of the industrial arts teacher in Arizona, as shown by teacher preparation, subjects taught, class size, school size, and extra-curricular responsibilities.

3020. BRYCE, WILLIAM. ***Opportunities for Professional Growth of Industrial Arts Teachers in Atlanta, Georgia.*** **M. A., 1952, University of Florida. 91 p. Library, University of Florida, Gainesville.**

Purpose: To present the many opportunities for professional growth that exist in the Atlanta area which may contribute to the enrichment of the industrial arts program.

Source of Data: Data were secured by a questionnaire and interview study of the industrial arts programs in the Atlanta area.

Findings and Conclusions: Industrial arts teachers need to develop at least as much skill as they hope to impart to their students. In addition to the cultural background required of all teachers, a complete mastery of the teacher's subject area is necessary.

3021. BURWELL, WILLIS E. ***Industrial Arts Pupil Opinion.*** **M. A., 1944, University of Minnesota. 71 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To improve industrial arts content and procedure through knowledge of pupil opinions.

Source of Data: Data were obtained from a questionnaire sent to pupils and a survey of literature.

Findings and Conclusion: The report contains a statement of opinions of pupils with suggestions for improving industrial arts instruction based thereon.

3022. BUTLER, JOHN HAROLD (M. S.). ***An Analysis and Comparison of the Related Technical Information given in the Industrial Arts Wood Working Courses in the Public Secondary Schools.*** **University of Southern California, 1935. 144 p.**

An attempt to determine the prevalent methods of teaching the related technical information necessary for industrial arts woodworking and to suggest certain basic principles which should control such teaching. A short history of manual training in the United States is included.

3023. CALBURN, A. L. (M. S.). *The Teaching of Industrial Arts in Maryland—A Detailed Study of the Industrial Arts Program in the Counties of Maryland Including the Schools in Which Industrial Arts is Taught, the Qualifications of the Industrial Arts Teachers, and the Teaching Load.* The Stout Institute, 1941. 83 p.

A statistical survey of the industrial arts teachers in Maryland, with the exception of those in Baltimore, to determine their status in training, experience, salaries, and teaching load. The conclusions point up the need for improvement in industrial arts teaching situations.

3024. CAMPBELL, HERBERT VINCENT (M. A.). *Problem—To Determine the Correlation Between Pupils' Industrial Arts Training in High School and Their Work After Leaving High School.* University of Colorado, 1933. 43 p.

A descriptive analysis of the values of industrial arts as compared to present vocations of Kansas City, Missouri, high school graduates from 1898 to 1930.

3025. CAPRON, ALBERT MARSHALL (M. S.). *How Technical Industrial Arts Courses May Contribute to the Training of Expressional Hand-Work Teachers in Grades I to VIII.* Oregon State College, 1932. 57 p.

A study to determine the factual basis for setting up a course of study for training classroom teachers who will be able to handle "expressional handwork" in the first eight grades. The survey covers eighteen states, 224 rural schools, and two hundred city schools.

3026. CARTER, ASA (M. S.). *Preparation, Teaching Program and Extra-Curricular and Other Activities of 457 Industrial Arts Teachers in the Junior and Senior High Schools of Illinois.* Iowa State College, 1933. 181 p.

An investigation of the teacher preparation, teaching program, and extracurricular activities of 457 industrial art teachers in Illinois.

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3027. CHAMBERLAIN, DUANE GLEN. *Factors Relating to Teaching of Practical Arts Activities in the Elementary Schools of Michigan.* Ph. D., 1954, University of Michigan. 166 p. Library, University of Michigan, Ann Arbor.

Purpose: To isolate and investigate factors relating to teaching of practical arts activities in self-contained classrooms of the elementary schools of Michigan; to assist classroom teachers, administrators, and teacher trainers; to locate and eliminate or alleviate factors which inhibit utilization of practical arts work in the elementary grades, and to locate and promote factors which contribute to effective use of practical arts in the elementary grades.

Source of Data: Data were obtained from a survey of elementary teachers who were not using practical arts activities and from elementary teachers who were using practical arts activities.

Findings and Conclusions: Industrial arts in the elementary school is usually taught by classroom teachers who have more general professional and industrial arts college training. Personal characteristics, teaching load, a rigid daily program of studies, and classroom size do not appear to affect the role of industrial arts in the elementary grades. Attitudes of superiors, parents, press, noise from work, and classroom acoustics play a role influencing the inclusion or exclusion of industrial arts. Teachers using these activities usually receive higher salaries. Costs of instructional supplies are greater when industrial arts is included.

3028. CHANEY, J. D. *Standards, Practices, and Evaluation of Industrial Arts Students Teaching in the Agricultural and Mechanical College of Texas.* M. Ed., 1952, Agricultural and Mechanical College of Texas. 32 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To analyze and compare the objectives and practices in student teaching and to evaluate the professional work done by student teachers from the Industrial Education Department of the college.

Source of Data: Data were secured from books, periodicals, and unpublished materials, and from questionnaires and personal interviews with students who had completed student teaching, graduate students, and teachers in the local area.

Findings and Conclusions: The student teaching program is well founded in its philosophy, techniques, and methods. Student teachers want: training in more than one level; more responsibility and authority in their classes; more shop maintenance, either in student teaching courses or in other required courses; more individual conferences with the Director of Student Teaching and with the supervision teacher, and more time allotted for supervision; a more true-to-life situation presented to them in their courses.

3029. COLBURN, ARTHUR L. (Masters). *The Teaching of Industrial Arts in Maryland.* The Stout Institute, 1941.

3030. COLSON, C. C. (M. A.). *A Study of the Effects of the War on Industrial Arts Education in the State of Florida.* University of Florida, 1945. 59 p.

A consideration of the effects of the war on industrial arts programs in Florida, from the standpoint of areas, equipment, and personnel.

3031. CONNER, SAMUEL G. (M. S.). *Analysis and Comparison of Observation of Teaching Reports Submitted by Three Groups in Industrial Education in State Teacher Training Center, New York City.* Pennsylvania State College, 1939. 164 p.

Prepares materials and procedures for industrial teacher training students participating in observation of teaching. An analysis of these materials based on their effectiveness in actual use is included.

3032. COOPER, LESLIE A. (M. A.). *A Survey of the Prevailing Practices in the Industrial Arts Courses in the Larger Cities of the State of Illinois.* State University of Iowa, 1938. 108 p.

A study considering prevailing practices in industrial arts courses in thirty-four of the larger cities of Illinois. It investigates teacher-training, methods of teaching, time spent, units taught, equipment, and course content.

3033. COSGROVE, JAMES J. *Differentiate Between the Aims and Objectives of Vocational Industrial Education and Industrial Arts Education.* M. Ed., 1952, Agricultural and Mechanical College of Texas. 27 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To differentiate between the aims and objectives of vocational industrial education and industrial arts education and to locate and define the causes for antagonism between the two programs.

Source of Data: Data were obtained from books, encyclopedias, and periodicals.

Findings and Conclusions: The aims and objectives of the two programs are different; yet the two are alike in many respects. It would probably be more advantageous to the student to have industrial arts education before he enters the vocational program.

3034. CRAFT, ARTHUR W. (M. S.). *Deficiencies in Qualifications of Industrial Arts Teachers in Northwest Ohio.* Iowa State College, 1938. 104 p.

An analysis of the opinions of fifty high school principals to determine the nature and extent of certain deficiencies in the qualifications of industrial arts teachers.

3035. CRAWFORD, J. C. (Masters). *Industrial Education Problems Peculiar to the Rural School.* Oklahoma A. and M. College, 1932.

3036. CUFFEL, JOE E. (M. A.). *A Descriptive Analysis of the Teachers of Industrial Arts Education in the High Schools of Iowa with a Pupil Enrollment of 80 or More.* Colorado State College of Education, 1937. 111 p.

A personal study of the industrial arts teachers of Iowa as determined by professional education, major and minor, trade experience, teaching experience, size of school, salary, and subjects taught.

3037. CULLERS, J. EDGAR (M. A.) *A Study of the Training of Industrial Arts Teachers in Texas.* Colorado State College of Education, 1934. 55 p.

A study of the teacher of industrial education in Texas through a study or teacher activities in the class room.

3038. CURTIS, ALFRED S. (Masters). *Industrial Fundamentals for the First Year of General Industrial Education in the Small Secondary Schools.* University of Virginia, 1945.

3039. DHALLEN, CHARLES WELLINGTON. *Armed Forces Training and American Technical Education.* M. A. 1948, Ohio State University. 91 p. Education Library, Ohio State University, Columbus.

Purpose: To analyze and reflect on the development of these training programs and to identify any elements that have implications for peacetime education.

Source of Data: An analysis of the methods employed by the armed forces during World War II.

Findings and Conclusions: The war vividly established the need for new types of public education. As revealed in this study the ample funds provided the service schools for training purposes eliminated many obstructions merely because of this fact, and resulted in a superior accomplishment.

3040. DALTON, PHILIP H. (M. S.). *Period Furniture in America Adapted for High School Industrial Arts Classes.* University of Tennessee, 1943. 96 p.

An analytical description of the types of furniture in America that could be adapted to industrial arts classes. A description of furniture from the early Egyptian to the modern American types is included.

3041. DAVIS, BERNARD A. *The Feasibility and Desirability of Co-Education in the Practical Arts of the Junior High School Level.* M. A., 1949, Catholic University. 54 p. Library, Catholic University, Washington, D. C.

Purpose: To determine whether the practice of splitting sections of pupils into two groups should be continued, a practice wherein boys take woodwork, metalwork, or printing and the girls take cooking, sewing or homemaking.

Source of Data: An opinion survey was conducted to determine the feelings of pupils, practical arts teachers, principals, and assistant principals. The pupil questionnaire was filled out by 2,238 pupils, the teacher questionnaire by 45 teachers, and the administrator's questionnaire by 22 principals and assistant principals.

Findings and Conclusions: While some educators are opposed to co-education in some shops subjects, they readily agree that the subject area should not be denied the pupils because of their sex. About 10 percent of the pupils in junior high school have shown an interest in practical arts subjects which are customarily denied them. Fifty percent of the teachers as well as administrators were willing to accept a co-educational program of practical arts. Proponents should be given the opportunity to work with experimental classes of mixed groups.

3042. DAVIS, ERNEST HENRY (Masters). *Industrial Arts Teaching as a Vocation.* Ohio State University, 1940.

3043. DOGGETT, BYRON C. *Effectiveness of Secondary School Industrial Arts Drawing in Texas.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 72 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the value of industrial arts drawing in the secondary schools of Texas to students of engineering drawing at Agricultural and Mechanical College of Texas.

Source of Data: Data on 450 freshmen were studied. All students in engineering drawing were included. Students completed check sheets. Instructors grades were used. Two groupings were made; those without secondary school drawing and those with secondary school drawing experience.

Findings and Conclusions: Students with as many as 2 semesters of high school drawing made a significantly better record in the introductory college drawing course than those without preparation. Advantage was not so evident in the 2 second semester college drawing courses.

3044. DONALDSON, CLEO JOHN HENRY (Masters). *The Industrial Arts Library: Its Organization and Use.* Ohio State University, 1933.

3045. DOSTER, ROBERT OWEN. *General Education Through Integration of Industrial Arts and Home Economics.* M. A., 1952, The Ohio State University. 85 p. Library, The Ohio State University, Columbus:

Purpose: To ascertain common areas of industrial arts and home economics and the desirability of establishing a curricular unit for boys and girls in problems of daily living.

Source of Data: Data were obtained from a questionnaire sent to 125 industrial arts instructors and 125 home economics instructors.

Findings and Conclusions: There is a sufficient overlapping of both teaching techniques and nature of offerings to allow for the development of general education units designed

to help both boys and girls to understand our technological society.

3046. DOW, ERNEST L. ***Cooperative Teacher-Pupil Planning: A Study of the Related Arts of the University School, Ohio State University.*** **M. A., 1948, Ohio State University. 140 p. Education Library, Ohio State University, Columbus.**

Purpose: **To illustrate and describe a school program which used the personalized system of instruction and to substantiate the argument for cooperatively planned educational experiences.**

Source of Data: **A series of interest scales were devised to show the number of pupils participating in the activties composing the related arts program. Data secured indicated trends of pupil interests and weaknesses in the total program.**

Findings and Conclusions: **That greater emphasis should be placed on planning experiences in activities which are lacking in interest to pupils, as revealed by limited participation. Suggestions and recommendations were offered to promote greater instructional efficiency and to afford experiences which would more nearly meet the needs of the child in promoting his optimal growth and development, based on his capacities, limitations and needs.**

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3047. DOWNING, DALLAS LUKE (Ed. D.). ***Professional In-Service Improvement of Trade Teachers in Ohio.*** **Indiana University, 1941, 222 p.**

An attempt to discover the influences and activities which, in the opinon of trade teachers in Ohio, have contributed most to their professional improvement after they began their teaching experience.

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3048. DRAZEK, STANLEY J. ***Field Experiences in Teacher Education With Recommendations for Industrial Arts Teacher Preparation.*** **Ph. D., 1950, University of Maryland. 358 p. Library, University of Maryland, College Park.**

Purpose: **To set forth the learning experiences provided by and the values accruing from directed field experience programs and to present elements of organizational plans and administrative procedures which tend to make a program successful.**

Source of Data: **A survey of existing field programs in teacher education was made to determine their characteristics. Twelve institutions were contacted directly and data were drawn from conferences, observations, and written descriptions. Twenty-three other institutions were contacted by mail.**

Findings and Conclusions: **The study presents 4 broad areas of possible field experiences: Industry, community, school, and child. Specific recommendations are made under each of the 4 areas as they related to industrial arts teacher-education programs. Under industrial experiences; visits and excursions to industry, work experience, and internship in industry are recommended. Under community field experiences; field trips, community study, and volunteer work in social agencies are suggested. Recommended school experiences include September field programs, and student assistantship or internship. Recommended experiences with youngsters include directed observations, and directed experiences in social agencies.**

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3049. DUNCAN, GLENN SPENCER. ***Practical Arts Activities Employed by Elementary Classroom Teachers and Their Desirability for Teacher Education.*** **Ed. D., 1950, University of Missouri. 316 p. Library, University of Missouri, Columbia.**

Purpose: **To discover what is being done with practical arts activities in the elementary school by superior teachers; to ascertain what practical arts experiences, superior teachers and other competent authorities think are needed in teacher education; and to suggest some implications of the above for elementary teacher education.**

Source of Data: **Information forms were sent to the following elected respondents: 266 elementary classroom teachers, 148 elementary principals or supervisors, 168 critic teachers, and 46 authorities (writers). The responses of these 622 individuals from over the nation comprised the data for this study.**

Findings and Conclusions: **Teachers who had college work beyond a master's degree were the most consistent users of practical arts activities. Those with less than 5 semester hours of practical arts subjects did little or nothing in utilizing them, and they had the least desirable room set-up for conducting their activities, while those with the most special traning used the activities the most frequently in providing the preferred physical arrangements and obtaining budgetary allowances for materials. As the grade level increased there was a tendency for more practical arts activities to be used. Certain criteria which respondents have repeatedly urged to be kept in**

mind in using practical arts activities in the elementary program are: Practical arts activities must not be ends in themselves, but support the teaching unit; construction must be simple and not involve intricate skills; constructions must be representative of whatever is being portrayed and not something distantly removed; and constructions must be successful to give the learner the necessary motivating satisfactions. Methods of directing practical arts activities that were preferred by 50 percent or more of the respondends were: Cooperative planning by teacher and pupils; construction of separate group projects; construction of central group projects, such as a farm, store, stage set, etc.; construction of different individual projects; and working sketches and procedures prepared jointly by teacher and pupils.

3050. ELLENWOOD, THEODORE S. ***An Investigation of the Problems of the Beginning Industrial Arts Teacher.*** **M. A., 1950, Claremont Graduate School. 138 p. Library, Claremont Graduate School, Claremont, Calif.**

Purpose: To determine the problems of the beginning industrial arts teacher in order that the teacher preparation program in industrial arts may be improved.

Source of Data: One hundred and six recent graduates of the Industrial Arts Department of the Santa Barbara College were selected as respondents in a State-wide survey using a questionnaire of the check list type. In addition to this instrument, six graduates of the class of June 1949 agreed to keep a day-to-day account of their concerns and problems as experienced during the first days of teaching. Statements made by principals and administrators regarding the selected teachers were also included.

Findings and Conclusions: The 102 respondents' teaching time was as follows: 42 had taught less than 2 months; 39 had started their second year; and 22 had started their third year. The student enrollment in the employing schools varied from 75 to 4500 students. The returns indicated that certain problems were common regardless of the enrollment factor. The respondents indicated a need for better professional preparation in the following: A better understanding of the problems of less educatable young people; knowledge of how to solve specific student behavior problems; the need of having a source of suitable teaching aids, projects, models, etc.; the need for more specific training in the area being taught; and the need for better preparation in a teaching philosophy which is compatible with current ideas regarding education.

3051. ERICKSON, KENNETH J. ***Common Faults of First-Year Industrial Arts Teachers.*** **M. A., 1950, University of Minnesota. 67 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: A study of the major and minor faults of first-year industrial arts teachers in the State of Wisconsin as observed by their supervising principals.

Source of Data: Questionnaire sent to 225 principals of Wisconsin high schools.

Findings and Conclusions: First-year industrial arts teachers have common faults that fall into five categories. A definite need exists for closer co-ordination among the teaching profession to overcome common faults.

3052. ESSEX, EUGENE (M. S.). ***Establishing the Foundation of a Course of Study for the Preparation of Industrial Arts General Shop Teachers for the Junior High Schools of New York State.*** **Syracuse University, 1936. 387 p.**

A survey of the literature of general and industrial education to derive objectives for an industrial arts teacher training program for a general shop. These objectives, based on the needs of prospective teachers, are classified, analyzed, and summarized.

3053. FEUCHES, CONRAD. ***Training and Experience of Industrial Arts Teachers in the San Joaquin Valley.*** **M. S., 1949, Oregon State College. 106 p. Library, Oregon State College, Corvallis.**

Purpose: To investigate the formal education, certification and experience of industrial arts teachers throughout the San Joaquin Valley of California during the school year 1948–49.

Source of Data: Survey of formal education and teaching experiences of industrial arts teachers in San Joaquin Valley

Findings and Conclusions: Administrators are not giving enough consideration to the teacher's preparation before hiring. The teacher's major and minor fields of preparation need to receive greater attention by the administrators when class assignments are made. A greater emphasis should be placed on unit shop credentials for industrial arts teachers by both the educational institutions and employer.

3054. FIELDS, NORVAL DEE. ***Effective Discipline in Industrial Arts.*** **M. S., 1955, Oklahoma Agricultural**

and Mechanical College. 44 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the underlying causes of poor classroom control, make recommendations to improve causative factors, and to give authoritative comment on effective disciplinary measures based on the findings of the study.

Source of Data: Data were secured from books and periodicals.

Findings and Conclusions: Effective classroom control has its foundations in good teacher planning, preparation, and delivery. Whenever possible factors should be removed which later may make disciplinary action necessary. When control problems arise, disciplinary action should be suited to each individual personality.

3055. FOLEY, DAVID WASH. ***Problems of the University of Florida Industrial Arts Graduates 1946–1952.*** **M. A., 1953, University of Florida. 83 p. Library, University of Florida, Gainesville.**

Purpose: To identify the problems confronting the beginning industrial arts graduate.

Source of Data: Data were secured from questionnaires, letter, conferences, and interviews.

Findings and Conclusions: Industrial arts teachers find it difficult to live on a teaching salary. Beginning teachers have common problems, and efforts should be made at teacher training institutions to reduce these problems to a minimum.

3056. FORNWALT, RUSSELL S. (M. S.). ***The Teaching Load of Vocational Shop Teachers of Pennsylvania.*** **Pennsylvania State College, 1932. 78 p.**

A study of the teaching load of trade and industrial teachers in Pennsylvania for the period 1929 to 1932. It considers the need for scientific study to determine the logical teaching load for shop teachers.

3057. FOWLER, DWIGHT ARNETT. ***A Bicycle Repair Unit in the Junior High School General Metals Shop.*** **M. Ed., 1952, Wayne University. 38 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To ascertain the activities of an experimental class introducing bicycle repair and maintenance in general metalwork.

Source of Data: Data were obtained from an experimental junior high school class in general metalwork.

Findings and Conclusions: The bicycle unit was definitely a good method of motivating industrial arts learning and the teaching of metalworking skills.

3058. FRAKES, FRANCES SUE NELL (M. A.). ***Design Background and Needs of Industrial Arts Teachers.*** **Colorado State College of Education, 1941. 65 p.**

A descriptive analysis of design teaching problems of industrial arts teachers. The design preparation required in eighty educational institutions is also reported.

3059. FREDERICKSON, KENNETH W. ***Teaching Methods and Technology Used in industrial Education.*** **M. S., 1952, Kansas State Teachers College. 67 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To collect information, statements, principles, and objectives used in industrial education, especially as they bear on teaching methods.

Source of Data: Data were obtained from an analysis of the professional literature in the field of industrial arts.

Findings and Conclusions: A compendium on methodology was compiled which should be a timesaver for the industrial arts teacher. A comprehensive examination covering the basic material is included.

3060. FREEMAN, ZANONI B. ***Correlations between the Academic and Shop Records of 536 Boys in the Henry Ford Trade School.*** **University of Michigan, 1930. 91 p.**

3061. FRENCH, FINLEY (M. S.). ***A Study of the Status of Mechanical Drawing in the Secondary Schools of Indiana Together with a Suggested Course of Study.*** **Indiana State Teachers College, 1935. 56 p.**

A study based on a questionnaire survey of teachers of mechanical drawing to determine the objectives, content of courses, and methods of presentation of mechanical drawing. Data that may be used in organizing course content in mechanical drawing are included.

3062. FRIESE, JOHN FRANK (Masters). ***An Analysis of Industrial***

Arts Teaching and Preparatory Teacher Training. University of Wisconsin, 1930.

3063. **GALLEY, CYRUS A.** *Effectiveness of Teaching Basic Elements of Industrial Arts As An Introductory Seventh Grade Course.* M. S., in Ind. Ed., 1950, Iowa State College. 51 p. Library, Iowa State College, Ames.

Purpose: To see whether the teaching of the basic elements of industrial arts in an introductory unit is advisable and whether the introductory unit changed the preference of the pupils taking it towards the exploratory or elective units.

Source of Data: The experiment was conducted in the industrial arts departments of the two junior high schools in Moline, Illinois, during the 1949–1950 school year. Only students taking industrial arts in the seventh grade were in the experiment.

Findings and Conclusions: The experimental group showed a higher achievement and a more frequent change of preference.

3064. **GARDNER, ROYAL WILLARD.** *A Comparison of Related Information for Industrial Arts Classes with a National Study of Standards.* M. S., 1950, Oregon State College. 114 p. Library, Oregon State College, Corvallis.

Purpose: To compare related information taught in Oregon's secondary school industrial arts classes today with a national study made by the committee on Standards of Attainment in Industrial Arts Teaching appointed in 1927.

Source of Data: Questionnaires sent to all industrial arts teachers of the secondary schools of Oregon.

Findings and Conclusions: The industrial arts instructors in Oregon agree quite closely with national study as to what should be the topics of related information taught in the various subject areas.

3065. **GASTON, MABEL (M. A.).** *Comparative Study of Women Industrial Arts Students in the Trenton, New Jersey State Teachers College,* Teachers College, Columbia University, 1932. 31 p.

A study of the intelligence, personality, handwriting, and competency in fine arts and in industrial arts of eighty-five women students in the sophomore class in an effort to predict the success of prospective students in industrial arts.

3066. **GOSSETT, WILLIAM.** *Elementary Teacher Education for Industrial Arts in Wood and Metal Areas.* M. S., 1954, Kansas State Teachers College. 48 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To analyze the teacher education practices in elementary education in the wood and metal areas.

Source of Data: Data were obtained from literature on the subject, and from a questionnaire.

Findings and Conclusions: A need exists for educating teachers in the elementary industrial arts field. Training institutions are not adequately supplying the demand. Arts, fine arts, crafts, and industrial arts are terms needing further clarification.

3067. **GREEN, HOWARD WILSON** (Masters). *Setting up a Suggested Method for Organizing and Teaching the Needed Skills and Information on 50 Shop Jobs that Are Adapted to Reeltown Community.* Alabama Polytechnic Institute, 1940.

3068. **GUESS, EDGAR A.** *A Survey of the Objectives of Industrial Arts in the Separate Schools.* M. S., 1953, Oklahoma Agricultural and Mechanical College. 65 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the behavior changes in students who take industrial arts.

Source of Data: Data were obtained through a questionnaire and a study of library books.

Findings and Conclusions: Teachers of industrial arts agree rather closely as to objectives yet some are doing very little to achieve these objectives. In some cases, there is very little evidence of the behavior changes that should take place in the students.

3069. **GUZMAN, IGNACIO L.** *Occupational Progress Made by Industrial Education Graduates of Tuskegee Institute.* Iowa State College, 1948. 51 p.

A study to discover the extent to which graduates of the industrial departments of Tuskegee Institute have succeeded in putting into practice the instruction received in their respective trades and to learn about their economic progress since graduation.

3070. **HAFER, ERNEST B.** (Masters). *An Evaluation of Some of the Personality and Intellectual Differences between Those Pupils Who Elect and Who Do not Elect Industrial Arts Courses in Certain Rural Schools in Adams and Brown Counties, Ohio.* Miami (Ohio) University, 1940.

3071. **HALL, ROBERT O.** *Evolution of and Trends in Industrial Arts Education in the Secondary School.* M. A., 1948, Kent State University. 126 p. Library, Kent State University, Kent, Ohio.

Purpose: To improve the industrial arts curriculum through a brief study of the evolution and trends in industrial arts education.

Source of Data: A survey was made and questionnaires were designed for pertinent data; area was limited to secondary schools. Various observations and interviews were made.

Findings and Conclusions: Danger exists in the tendency of some industrial arts leaders to expand the program too widely. Industrial arts would make a greater contribution in most county schools if they were organized on the basis of the general shop. Many teachers in industrial arts need to be more familiar with industrial arts objectives proposed by leaders in the field. Industrial arts instructors must constantly be on the alert as to pupil needs and changes in society, new tools, new materials, new processes, etc., if they are to keep pace with the rapidly changing curriculum.

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3072. **HAMILTON, ALLEN THURMAN** (Ed. D.). *Trade Teacher Training in the United States Under State Plans of 1937.* Indiana University, 1941.

This study attempts to determine certain facts relative to agencies, organizations, costs, and enrollment in the field of teacher training. It considers the status of the work of teacher training in the field of trade and industrial education under the provisions of the state plans for the five year period, 1937–1942.

3073. **HANSON, MURILL H.** (M. S.). *An Analysis and the Determination of Trends of Teaching Combinations and Salaries of Teachers of Industrial Arts in Iowa, 1922–1932.* Iowa State College, 1932. 34 p.

An analysis of trends in teaching combinations and salaries of industrial arts teachers in Iowa. The study covers a ten-year period, 1922–1932.

3074. **HARRISON, NICHOLAS S.** *What Should Comprise a Course in Frame Construction for Negro Vocational Schools in Louisiana.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 134 p. Library, Colorado Agricultural and Mechanical, Fort Collins.

Purpose: A survey of existing conditions, as they applied to the problem.

Source of Data: A survey was made through correspondence with key individuals and companies and through a careful examination of literature pertinent to the field, covering the period from 1936 through 1949.

Findings and Conclusions: That the various publications, pertinent to the subject of frame construction for vocational schools, afforded materials of an informative and phychologically sound nature. The course outline should be cooperative, adapable to individual and community resources, and subject to continuous re-evaluation and modification.

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3075. **HARRISON, PAUL E. Jr.** *Problems of Beginning Industrial Arts Teachers.* Ph. D., 1955, University of Maryland. 191 p. Library, University of Maryland, College Park.*

Purpose: To learn from beginning industrial arts teachers what they regarded as their primary professional difficulties.

Source of Data: Data were secured by an instrument development to ascertain the professional problems of beginning industrial arts teachers.

Findings and Conclusions: The data indicate that the areas of curriculum and instruction, the physical facilities available for teaching, and teacher-pupil relationships were the categories in which industrial arts teachers reported the greatest number of persistent problems. There was little variation in problem insight according to the teacher's scholastic achievement at the undergraduate level. The type of supervision afforded the beginning industrial arts teacher did not mitigate or change the level of importance of the problems confronted. There was little difference in the problem reports of teachers at the junior, junior-senior, or senior high school levels. General shop and unit shop teachers reported having the same or similar problems.

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3076. HASTINGS, JAMES ROBERT. *An In-Service Education Program for Teachers of Industrial Arts in New York State.* **Ed. D., 1953, New York University. 214 p. Library, New York University, New York.***

Purpose: To identify needs for in-service education industrial arts teachers in the State of New York and to make recommendations for meeting these needs through programs involving the services of such existing agencies as the public and private teacher training institutions of the state and the State Education Department.

Source of Data: Data were gathered using normative survey type of research. It included 1298 industrial arts teachers, 42 supervisors, and 50 high school principals.

Findings and Conclusions: Industrial arts teachers in general have been active in their in-service growth. Teachers have access to some well developed institutional programs of on-campus study. The in-service educational needs of the teachers were classified and were indicated according to their frequency of preference. There is a considerable need for more off-campus offerings by institutions concerned with the in-service growth of industrial arts teachers of the state.

3077. HAUER, NELSON A. (M. S.). *Problems of Beginning School Shop Instructors.* **Louisiana State University and A & M College, 1939. 69 p.**

An investigation of the problems encountered by beginning industrial arts and trade teachers in ten southern states in 1939. Suggestions for meeting these problems in teacher education programs are offered.

3078. HAYES, LAWRENCE EMERY. *A Study of the Ability and the Characteristics of Students Who Elect Industrial Arts Courses in Kanawha County, West Virginia.* **M. A., 1948, Ohio State University. 71 p. Education Library, Ohio State University, Columbus.**

Purpose: To determine some of the more obvious aptitudes, abilities, and interests which characterize the boys who elect industrial arts.

Source of Data: Administration of tests and the use of a questionnaire.

Findings and Conclusions: The non-industrial arts student ranks higher according to mean averages in respect to: General intelligence; specific intelligence or mechanical; academic accomplishment; educational ambitions; and educational background. The industrial arts group is characterized by: Desire for vocational training; tendency toward occupational succession; and inclination toward wide experience with mechanical tools.

3079. HILL, ALTON D. *Industrial Arts in Minnesota.* **M. A., University of Minnesota, 1936. 34 p.**

A study of one-teacher industrial arts departments in Minnesota; offerings, enrollments, salaries, instructional costs, schedules, etc., as a basis for improved teacher training.

3080. HOHENSTEIN, ALLAN FLOYD. *Teaching Loads of Industrial Arts Teachers in Small Schools of Minnesota.* **M. Ed., 1955, Colorado Agricultural and Mechanical College. 142 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.**

Purpose: To ascertain the teaching and service loads of industrial arts teachers in small secondary schools of Minnesota and the effect of these loads on professional efficiency and growth.

Source of Data: Data were secured by questionnaires sent to one hundred and thirty industrial arts teachers and their superintendents.

Findings and Conclusions: Teaching loads were not abnormally heavy. In contrast, the service load activities were time consuming. Several activities were reported as being neglected because of the teaching and service load. Better teaching would probably result from lighter loads.

3081. HOLBROOK, FRANK AUSTIN. *Purposes, Methods and Manner of Organization and Presentation of Industrial Arts in the Elementary Schools of Washington.* **M. Ed., 1951, Western Washington College of Education. 39 p. Library, Western Washington College of Education, Bellingham.**

Purpose: To ascertain the status of industrial arts in the elementary schools of Washington.

Source of Data: Data were obtained from questionnaires sent to teachers and principals of elementary schools.

Findings and Conclusions: Activities engaged in were: paper projects, wood projects, claywork, textiles and weaving, metal projects, leatherwork and plastics projects, linoleum block printing, glass decoration, candlemaking, and soap carving. The demonstration was the most preferred method. Films, talks, pictures and bulletin board material were used.

3082. HOLK, IRWIN. *The Development of An Active Interest in Industrial Life.* M. A., 1950, University of Minnesota. 51 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To examine the nature and effectiveness of the methods used to interest high school students in industrial life.

Source of Data: Data were obtained from books, bulletins and periodical references.

Findings and Conclusions: Research is needed on this problem.

3083. HOLLIS, DAVID P. *An Analysis of the Enrollment in the Academic and Non-Academic Title Courses in the Senior High Schools of Texas. 1947–1948.* M. S., 1949, North Texas State College. 63 p. Library, North Texas State College, Denton.

Purpose: To analyze enrollments in the various subjects taught in the senior high schools in terms of modern educational needs and to ascertain the extent to which the schools are meeting these needs.

Source of Data: Principals of the high schools involved contributed data for the study. Additional data were obtained from professional literature in developing the criteria for the analysis of enrollments.

Findings and Conclusions: The secondary schools of Texas are gradually and steadily revising their programs to meet the needs of youth, 52.9 percent of the schools offer a dual program. Only 47.1 percent of the high schools were following the traditional program exclusively. Of the 117 schools included in the study, 24.7 percent were not meeting the academic requirements for accredited high schools. Industrial arts ranked first among the eight non-academic courses taught in the schools in terms of the number of boys enrolled. The needs of youth should be studied in the community and the curriculums revised to meet these needs.

3084. HOWE, EDWARD SHELDON (Masters). *Comparison of the Teaching Loads of Teachers of Industrial and Home Management Subjects and Teachers of Language, Mathematics, and Social Science,* Ohio State University, 1937.

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3085. HUNTINGTON, HAROLD A. (Ph. D.). *Industrial Vocational Teacher Education.* Ohio State University, 1940. 326 p.

An investigation of the policies affecting industrial vocational teacher education programs. It includes a description of the attitudes of national agencies and organizations toward these programs with emphasis on the attitudes of leaders in the field concerning the programs in effect from 1937 to 1942.

3086. HUTTON, ELLIOTT CHARLES (M. S.). *A Suggested Plan of Accreditation for Industrial Arts Teacher Education Departments.* Oregon State College, 1939. 115 p.

An attempt to satisfy the need for more uniformity in teacher training for industrial arts education. A set of criteria for evaluation is developed with detailed suggestions for application. The study suggests an organizational form for accrediting through N. E. A., the American Industrial Arts Association, and The National Accreditation Associations, for institutions offering industrial arts teacher training.

3087. IMBODEN, HERBERT B. (M. A.). *A Survey of Ninth-Grade Mechanical Drawing in the Principal Cities of the United States.* University of Pittsburgh, 1934. 37 p.

A survey to: (1) determine the content and scope of ninth-grade mechanical drawing as taught in the principal cities of the United States; (2) show the frequency of usage of various elements of mechanical drawing; and (3) ascertain the prevailing predominance of the use of certain textbooks, materials, and methods or techniques.

3088. IRWIN, JACK LEWIS. *Teaching Design in Industrial Arts.* M. Ed., 1954, Colorado Agricultural and Mechanical College. 70 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the principles of design that are applicable to industrial arts, the extent to which design is and may be taught, and what methods and techniques may be used to teach the principles of design.

Source of Data: Data were obtained through review of the literature, and from questionnaires sent to industrial arts teachers and art and industrial arts teacher educators.

Findings and Conclusions: All the principles of design are applicable to industrial arts. The teaching of design should receive more emphasis. The exhibition and discussion of examples of good and poor design was considered the most effective method of teaching design.

3089. JACKSON, GERALD G. ***A Comparison of Industrial-Arts and Non-Industrial-Arts Students.*** **M. S., 1951, Illinois State Normal University. 39 p. Library, Illinois State Normal University, Normal.**

Purpose: To make a comparison of a group of boys who elect industrial arts with a group of boys who do not elect industrial arts.

Source of Data: Data were obtained by comparing the results of the Illinois state-wide testing program, class rank, personality record, drop-outs, and the intelligence quotients of the classes of 1949, 1950, and 1951, of the Bloomington High School, Bloomington, Illinois.

Findings and Conclusions: On the average, the industrial arts group is lower in scholastic achievement, scholastic aptitude, and personality as rated by teachers, than is the non-industrial arts group. A large percentage of the industrial arts pupils drop out of school because of financial difficulties.

3090. JANKE, GEORGE W. (M.S.). ***A Study to Determine the Weaknesses of and the Professional Demands Placed upon the Industrial Arts Instructors of South Dakota.*** **Colorado Agricultural & Mechanical College, 1937. 102 p.**

A study of the weaknesses and needs of industrial arts teachers in order to keep them abreast of the developments in their field. Remedial measures are offered.

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3091. JENKINS, JAMES, ***Jr. The Content of Required Industrial Arts for Boys.*** **Ed. D., 1955, The Pennsylvania State University. 167 p. Library, The Pennsylvania State University, University Park.**

Purpose: To find the tool manipulations, information, attitudes, and habits that could be taught in industrial arts that are the most useful to most people.

Source of Data: Data were secured by a questionnaire containing 490 items of instruction in industrial arts, which were evaluated on a four point scale of usefulness by 1893 junior high school boys, 262 laymen, 109 shop foremen, and 51 labor leaders selected from all over the United States.

Findings and Conclusions: The study resulted in a list of items of instruction in industrial arts that the respondents considered most useful. Items receiving the highest ratings may be classified as safety, attitudes and habits, and general care of tools and machinery. A different list of items of instruction is not necessary in different geographic areas or in communities with predominately different occupational classifications.

3092. JENKINS, JOHN MACK, ***Jr. Certain Variables Differentiating Industrial Arts Students from Non-Industrial Arts Students in the Mooresville High School.*** **M. of I. A., 1955, North Carolina State College. 42 p. Library, North Carolina State College, Raleigh.**

Purpose: To ascertain the variables differentiating industrial arts students from non-industrial arts students in the Mooresville High School.

Source of Data: Data were secured from a questionnaire, standardized tests and the students personal records.

Findings and Conclusions: Students who elected industrial arts are less intelligent, older, less likely to participate in extra-curricular activities, show greater mechanical interest, and have failed more subjects than the non-industrial arts group. The industrial arts students are from lower income families and indicate little interest in higher education.

3093. JENSEN, CLARENCE DAVID. (M.S.). ***Correlation of Farm Mechanics and Industrial Arts in California.*** **Oregon State College, 1936. 72 p.**

The preparation of a course of study for the training of teachers for farm mechanics. The report suggests that more attention be given to the selection of the prospective teacher and that more time be spent in shop courses.

3094. JENSEN, ROBERT P. (M.S.). ***A Study of Industrial Arts Training for Elementary School Teachers.*** **The Stout Institute, 1938. 53 p.**

A study of the industrial arts work and construction problems which should be included in the training of elementary school industrial arts teachers. Data were secured from fifty teachers college industrial arts departments throughout the United States.

3095. JOHN FRANK D. (Masters). *Printing-Evaluation and Implication in an Enriched Industrial Arts Program of Progressive Secondary Education.* Ohio State University. 1935.

3096. JOHNSON, HARRY L. (Masters). *Teachers' Activities and Their Place in an Industrial Arts Student Teaching Program.* Wayne University, 1944.

3097. JOHNSON, WALFRED J. (M. S. in Ed.). *A Determination of Arithmetical Fundamentals Possessed by the Entering Students of a Vocational High School.* Cornell University, 1943.

3098. JOSSERAND, LOUIS L. (M. S.). *The Evaluation of a Method of Teaching Ninth Grade General Drafting.* Colorado Agricultural & Mechanical College, 1940. 109 p.

The relative effectiveness of teaching ninth year general drawing through sketching, construction, and the use of simplified instruments. A course of study is devised and the pupils achievement is tested.

3099. KALIFUT, EDWARD DONALD. *The Program of Industrial Arts in Steubenville, Ohio: A Description and Appraisal.* M. A., 1950, Ohio State University. 85 p. Education Library, Ohio State University, Columbus.

Purpose: To determine whether the program at Steubenville, Ohio has developed sufficiently to meet the changes brought about by new methods and standards of teaching and the changed social-economic conditions.

Source of Data: A personal visit to each school, an interview with the instructor and principal, and examination of each unit or shop, and a check list concerning the facilities of each unit or shop completed the analysis of each school.

Findings and Conclusions: The administration should relax its vigilance upon supplies, the instructors, and the laboratories and focus attention on providing adequate facilities for the program of industrial arts. The curriculum should be developed along lines which will offer a broad orientation program for the student who must become adjusted to the industrial society of which he is a member.

3100. KEELING, OWEN W. *A Problem of Related Information in Industrial Arts.* M. Ed., 1953, Agricultural and Mechanical College of Texas. 32 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the status of related information in industrial arts and to obtain opinions as to the amount of class time that should be devoted to the teaching of related information.

Source of Data: Data were secured from books, periodicals, pamphlets, and personal conferences.

Findings and Conclusions: Criteria should be developed, through research, for evaluating and selecting related information for industrial arts courses. Recommended time for teaching related information should not exceed 20 per cent of the class time.

3101. KELLEY, FREDERICK. *Problems Related to Industrial Arts in the Elementary School.* M. A., 1952, University of Maryland. 133 p. Library, University of Maryland, College Park.

Purpose: To identify and analyze certain problems related to industrial arts in the elementary school.

Source of Data: Data were obtained through an examination of the problems selected in relation to contemporary practice and theory as set forth by recognized authorities in the field of elementary education.

Findings and Conclusions: Elementary school industrial arts contribute to health and physical needs of the child. Through problem solving—planning, shaping, designing, combining and using materials—greater learning and fact retention result where there is manipulative participation than in conventional methods of study. Emotional needs—recognition through achievement and success—are satisfied through industrial arts, where opportunity is provided for working together in groups, where problems, materials, and ideas are shared.

3102. KING, CHARLES MICHAEL. *Contemporary Design as it May Be Applied to Industrial Arts in the Secondary Field.* M. Ed., 1952, University of Florida. 71 p. Library, University of Florida, Gainesville.

Purpose: To present ways and means of keeping industrial arts up to date in the area of contemporary design.

Source of Data: Data were obtained from textbooks, magazines, periodicals and catalogs.

Findings and Conclusions: There must be a need or function for every project built. The project must take the student through many learning experiences which will give him the necessary skill, information and appreciation.

3103. KJOS, OSCAR E. *Activities of Industrial Arts Teachers for Units of Instruction in Teacher Training Courses.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 79 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the activities of industrial arts teachers that should be included as units of instruction in teacher training courses.

Source of Data: A list of 150 activities was prepared and submitted to 110 teachers for checking.

Findings and Conclusions: Activities deemed of most importance were connected with aims, projects, methods, instructional units, records, testing, guidance, safety, discipline, student interest, tools, individual differences, professional growth and public relations.

3104. KLITGORD, OTTO D. (M. S. in Ed.). *Special Methods for the Evening Trade School.* Cornell University, 1939.

3105. KUHL, GEORGE W. (M. A.). *Personnel Study of Industrial Arts Teachers in Nebraska.* Colorado State College of Education, 1948. 139 p.

A personnel study of industrial arts teachers of Nebraska. In addition, the teachers reported teaching problems.

3106. KUSHMA, MICHAEL S. (M. S.). *Teaching Related Science.* Pennsylvania State College, 1933. 103 p.

A study which considers the size of classes, selection of text material, training of instructors, time allotments, nature of the course, sources of material, and certification of teachers in related science, in an effort to give assistance in developing a course of study in related science.

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3107. LAMBERT, JAMES HOWARD (Ph. D.). *An Analysis of Some Factors Which Are Significant in the Training and Experience of Teachers of Shop Subjects in Vocational Industrial Education.* Cornell University, 1940. 234 p.

A study investigating the background and development of industrial education in the United States and developing criteria for the selection and training of teachers of shop subjects.

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3108. LANDIS, RUSSELL HENRY (Ed. D.). *Teacher Education Programs and the Preparation and Teaching Positions of Industrial Education Teachers in Illinois.* Pennsylvania State College, 1940. 191 p.

An analysis of the educational and vocational experience of 297 teachers of industrial education and farm mechanics in the State of Illinois in 1938–1939.

3109. LEBUS, HAROLD B. (Masters). *A Study of Success Factors in Teaching Industrial Arts.* Wayne University, 1945.

3110. LEMLEY, JOE W. *Improving Industrial Arts Teaching Through Job Analysis.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 69 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile information relating to the improvement of industrial arts teaching through job analysis.

Source of Data: Data were obtained through a questionnaire and the construction of a job analysis schedule.

Findings and Conclusions: The similarity of work performed in industry and that taught in technical courses in industrial arts indicates the need for job analysis in teaching technical courses in industrial arts.

3111. LERNER, WILHELM ANTON. *Teaching Loads of Industrial Arts Teachers in High School of 200–300 Enrollment in Seven Missouri Valley States.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 112 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To determine the teaching loads and factors effecting teaching loads in 7 Missouri Valley States.

Source of Data: Questionnaire to 72 industrial arts instructors. Letters to several leaders in teacher training institutions.

Findings and Conclusions: Industrial arts teachers teach 5 classes daily—4 in shop and 1 in academic subjects. Extra-curricular activities take much of this time.

3112. LODER, EARL WILLIAM (M. S.). *An Analysis of the Training and Experience of Industrial Arts Teachers in the Villages of New York State Under a Superintendent of Schools.* Syracuse University, 1947. 153 p.

By means of a questionnaire circulated among 205 industrial arts teachers in 93 villages of New York State, factors regarding teaching load and extracurricular duties, trade and teaching experience, salaries, and participation in educational associations are investigated.

3113. LOVELESS, AUSTIN GUDMUND. *Content and Teaching Methods for Beginning Drawing in the Junior High Schools of Utah.* M. S., 1952, Oregon State College. 47 p. Library, Oregon State College, Corvallis.

Purpose: To ascertain the practices used in teaching beginning drawing at the junior high school level.

Source of Data: Data were secured by a questionnaire sent to Utah drawing instructors and examination of courses of study.

Findings and Conclusions: There is a trend away from formalized drawing courses toward more freehand sketching, with greater emphasis on understanding and interpreting drawings, and away from teaching drawing as a separate class for a given number of weeks, toward drawing as a part of the planning in the general shop program.

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3114. LUX, DONALD G. *Industrial Cooperative Vocational Teacher Education with Special Reference to the Projection of a Program in the State of Illinois.* Ph. D., 1955, The Ohio State University. 225 p. Library, The Ohio State University, Columbus.

Purpose: To develop a program of cooperative vocational teacher education for the State of Illinois.

Source of Data: Data were obtained through extensive travel and consultation with officials in cooperative programs in five states.

Findings and Conclusions: The University of Illinois, legally designated trade and industrial teacher education agency for the state, should institute the proposed program. The secondary schools should provide further preemployment trade and industrial training. Professional leadership should develop programs which combine the basic elements of a teacher education program: general, professional, and technical. State departments of education should reevaluate their certification requirements for trade and industrial teachers in the light of evolving educational concepts to assure the preparation of well-qualified trade and industrial teachers. A comprehensive evaluation should be made periodically to determine the effectiveness of the cooperative program and to help insure its continual improvement. The cooperative plan should be employed on a national scale where investigations reveal it may solve problems facing other states. Companion studies should be undertaken to discover the implications of the cooperative plan for programs preparing industrial training department personnel.

3115. LYNN, JOSEPH V. (M. S.). *A Study of Certain Standards and Practices in Iowa Concerning Teachers of Industrial Arts in General Schools, Vocational Trade Teachers in Day and Evening Schools, and Practical Shop Teachers in Continuation Part-Time Schools.* Pennsylvania State College, 1932. 85 p.

An outline of conditions in industrial arts and vocational education in Iowa with comments and recommendations for improvement. A study of the conditions and practices relating to industrial education teachers in Iowa is included.

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3116. MALEY, DONALD. *Student Teaching in Industrial Arts: A Study of Selected Problems with Recommendations for their Treatment.* Ph. D., 1949, University of Maryland. 168 p. Library, University of Maryland, College Park.

Purpose: To determine major problems in industrial arts student teaching in teacher education programs; to analyze procedures which attempt to meet these problems; and to present recommendations regarding the more promising procedures.

Source of Data: A survey of the literature dealing with policies and practices in student teaching in all areas was made. A preliminary survey was conducted to select the better programs in industrial arts student teaching. A final survey was made of thirteen institutions to determine current practices and procedures.

Findings and Conclusions: The study indicated an evident lag in the extent of practice as compared with the estimated value of a large majority of the items. In other words, practice is not on a level with the thinking and understanding of the authorities in the field. A need was also indicated for broadening the scope and sphere of activities of the student teacher in industrial arts education.

3117. MANN, KENNETH G. *Preparation and Duties of North Carolina Industrial Arts Teachers.* M. S., 1955, Iowa State College. 44 p. Library, Iowa State College, Ames.

Purpose: To ascertain the preparation and duties of the industrial arts teachers of North Carolina in the school year of 1952–1953.

Source of Data: Data were obtained from the files in the Divisions of Professional Service and Instructional Service in the State Department of Public Instruction, and from Statistics of Taxation, 1952.

Findings and Conclusions: There were 175 industrial arts teachers in North Carolina. Of the one hundred who had received Bachelor's degrees within the past seven years, eighty-two were graduates of Carolina institutions. Thirty-three teachers had Master's degrees. One hundred and fifty-four had a major in industrial arts. One hundred and seventeen were teaching other subjects in combination with industrial arts, with mathematics being the most frequent subject taught.

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3118. MARBURGER, EDWARD F. (Ed. D.). *Instructional Units for the Professional Courses in Vocational Industrial Teacher Education.* Pennsylvania State College, 1948.

Analyzes the activities performed by successful vocational industrial teachers throughout the United States to ascertain units of instruction for professional courses in the preparation of teachers in the vocational industrial field.

3119. MARSTON, ELIZABETH T. (Masters). *Comparison of Achievement in Algebra and Shop Mathematics.* University of Chicago, 1931.

3120. MARTIN, BERYL E. (Masters). *The Application of Accepted Criteria in the Analysis of Available Theses of Auto Mechanics.* Iowa State College, 1933. 87 p.

3121. MARTIN, GEBHARD. *Evaluation of Some School Shops on the Basis of Pupil Interest.* M. S., North Texas State College, 1942. 134 p.

A descriptive study as to the adequacy with which the industrial arts program is meeting the pupil interest in 3 Texas schools.

3122. MARTIN, JERRY LEE. *A Plan to Improve the Instructional Methods in Elementary Printing.* M. S. in Ind. Ed., Kansas State Teachers College, 1938. 92 p.

A proposal for teaching elementary printing in a college for Negroes.

3123. MATTHYS, WILIMA INNIS. *Life Adjustment Education for Youth.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 28 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To show what has and is being done through the combined efforts of the leading educators in both general and vocational education to meet the life needs of the youth in our secondary schools.

Source of Data: The information was obtained through reports on national committee meetings, conferences, panel discussions, group discussions, statements by leading educators, bulletins, and editorials on the action and works of the study on Life Adjustment Education Program for Youth.

Findings and Conclusions: If more emphasis is to be given to guiding the behavior, growth, and development of youth, then more of the teachers' education should be concerned with the variety, nature, and learning problems of the youth. Teachers must learn to work with all types of youth, and be skilled and competent in the field of human relations. Every student should be known intimately by at least one member of the faculty. Work experience should be provided for more students. Expansion of health and recreation is needed. Students who are failures need to find successes and standards of achievements should be adjusted to fit different standards of ability.

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3124. **MAYS, WILLIAM A.** *The Junior Achievement Movement: An Examination of its Psychological, Economical, Political, and Educational Significance.* Ph. D., 1954, The Ohio State University. 288 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the psychological, economical, and educational significance of junior achievement experiences.

Source of Data: Data were obtained from a nation-wide survey made by visitation and questionnaire. Literature in the field was studied and the national headquarters was visited.

Findings and Conclusions: The participants in the program developed a feeling of self-confidence, respect for others, a spirit of team-work, acceptance of responsibility, and understanding of the over-all operation of a business, and a realization of the rewards for initiative, dependability, good work, and cooperation. The Junior Achievement program provides an excellent opportunity for industry, business, and educational leaders to work together in the interests of youth.

3125. **McALLISTER, LORES BERNARD.** *Developing A Program of Industrial Arts with Specific Reference to Northeastern High School, Springfield, Ohio.* M. A., 1955, The Ohio State University. 77 p. Library, The Ohio State University, Columbus.

Purpose: To examine the industrial arts program in the city of Springfield, Ohio, and develop a comparable program for suburban Northeastern High School.

Source of Data: Data were obtained by interviews with teachers of industrial arts and by the use of the Industrial arts D-9 Form of the Evaluative Criteria.

Findings and Conclusions: More time should be allocated to the classes in industrial arts. Some emphasis should be placed on vocational preparation and more space and equipment should be provided for the Northeastern program.

3126. **McGAUGHEY, RICHARD EDWARD.** *Suggested Adaptations of Significant Period Furniture Designs to Contemporary Industrial Arts Programs.* M. Ed., 1951, University of Florida. 81 p. Library, University of Florida, Gainesville.

Purpose: To emphasize the need for proper design in the industrial arts laboratory and serve as a guide for furniture design in a woods laboratory on the secondary school level.

Source of Data: Data were secured through texts, catalogs, and periodicals on furniture design.

Findings and Conclusions: Furniture design and construction offer an excellent means of attaining the objectives of industrial arts and should be an integral part of that program.

3127. **McKNIGHT, HOWARD WAYNE.** *Value of High School Subjects as Rated by Former Pupils.* M. S., 1950, Iowa State College. 113 p. Library, Iowa State College, Ames.

Purpose: None reported.

Source of Data: Two hundred and eighteen graduates of the classes of 1935–1941 and 1945–1948 of Wilson High School, Cedar Rapids, Iowa.

Findings and Conclusions: None reported.

3128. **McLEOD, JEREMAIAH W. (M. Ed.).** *Trade and Industrial Teacher-Training Programs for Negroes in the Southern Region.* Colorado Agricultural & Mechanical College, 1944. 177 p.

A description of what is being taught in trade and industrial divisions of the state departments of vocational education. Also discussed are the state requirements for training teachers, information on shops and equipment, and types and sizes of shops. Changes are proposed.

3129. **MEAD, CARY ROBERT (M. S.).** *A Study of Teaching Problems Common to New Teachers of the Industrial Arts Subjects,* Oregon State College, 1936. 81 p.

A study of the problems encountered during the first few years of teaching, with indications for teacher training colleges and prospective teachers preparing in colleges. Eighty-nine teachers trained at five leading west coast colleges were surveyed.

3130. **MESLOW, EDWIN C. (Masters).** *Industrial Arts Indicator for Prospective Teachers.* University of Wisconsin, 1932.

3131. **MEULER, MILTON CARL.** *The Extent to Which Industrial Arts Contributes Toward the Recognition of Aesthetic Qualities in Industrial Products.* M. S., Iowa State College, 1939. 92 p.

A study to determine, as far as possible, the extent to which industrial arts contributes toward the recognition of aesthetic qualities in industrial products. Of secondary importance, to stimulate and encourage interest, thought, and activity in the field of industrial arts design.

3132. **MILLER, EUGENE CLYDE.** *The Use of Mobile Units in Industrial Instruction.* M. A., 1953, University of Minnesota. 61 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To ascertain the extent to which mobile units have been used for industrial instruction in the U. S.; and to evaluate this effectiveness.

Source of Data: Data were obtained through a questionnaire sent to state supervisors of industrial education.

Findings and Conclusions: Mobile units have been used in nearly every state at one time or another. Best results per dollar spent seem to come from rural areas. Mobile units are used to fill many blanks and are discontinued as other schools and agencies take over.

3133. **MILLER, WILLIAM B. (Masters).** *A Study of the Number of Years College Training and Extent of Trade Experience of the Subsidized Vocational Industrial Teachers Now in Service in the Eastern Area of Pa. Including their Trade Experience Since Beginning to Work as Teachers.* University of Pennsylvania, c. 1935–47.

3134. **MONK, BEN JUNIOR.** *Attitudes Industrial Arts Students in the Secondary Schools of Kansas Have Toward Industrial Arts.* M. S., 1952, Kansas State Teachers College. 55 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the attitudes of industrial arts students in Kansas toward industrial arts.

Source of Data: Data were obtained from a questionnaire given to secondary school students concerning their likes and dislikes, opinions and beliefs with respect to industrial arts.

Findings and Conclusions: Students see the need and usefulness of industrial arts subjects. Their responses substantiated the common objectives of industrial arts. Students think industrial arts should be offered more comprehensively and that it is an important part of general education.

3135. **MORTIMER, WILLIAM EARL (M.S.).** *A Study of the Time Allotment for Teaching the Informational Content of the Major Industrial Arts Subjects.* Oregon State College, 1941. 118 p.

3136. **MOSELEY, GILBERT ARNOLD (M.S.).** *Job and Equipment Training Recommendations of Licensed Aircraft and Engine Mechanics.* Iowa State College, 1948. 64 p.

A study to determine the job and equipment training recommendations of licensed aircraft and engine mechanics for the training of student mechanics in vocational schools.

3137. **MUDD, J. KELLY.** *A Study of the Relative Time Expended on Preparation for Instruction, Class-Room Instruction, Shop Management and Other Duties by Industrial Arts Instructors in Kansas.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 72 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the time spent by industrial arts teachers on their various duties.

Source of Data: Recorded information from the files of the Kansas State Department of Public Instruction, Topeka, Kansas, and 304 questionnaires returned by Kansas industrial arts teachers.

Findings and Conclusions: The median hours expended per week by industrial arts teachers (51.6) was double the maximum load of 25 hours per week recommended by the State Department of Public Instruction. The average time expended per week on preparation for instruction was only 2.8 hours, which alone would indicate the quality of teaching that is being done.

3138. **MYERS, WARREN W. (M.A.).** *The Status of Industrial Arts In-*

structors in the Junior High Schools and Grade Schools in Illinois. Colorado State College of Education, 1941. 98 p.

A personnel study of junior and senior high industrial arts teacher of Illinois through a study of class schedules, preparation, size of school, extra-curricular activities, and current teaching problems.

3139. NEILL, THEODORE R. (M. S.). *The Mathematics Involved in the Teaching of Industrial Arts.* Iowa State College, 1931. 69 p.

A questionnaire study to discover the elements of mathematics which are of greatest value to the teacher of industrial arts subjects in Iowa, Minnesota, Wisconsin, Illinois, Missouri, Kansas, Nebraska, and South Dakota.

3140. NEUMAN, ERNEST OTTO. *Instructional Problems in the Teaching of Industrial Arts in the 6th, 7th, and 8th Grades of Lewis County, Washington.* M. Ed., 1952, Western Washington College of Education. 38 p. Library, Western Washington College of Education, Bellingham.

Purpose: To examine the industrial arts program in the 6th, 7th, and 8th grades of Lewis County and to suggest ways of improving this program.

Source of Data: Data were secured by questionnaires and interviewing.

Findings and Conclusions: Only 35 per cent of the schools reported an industrial arts program in the 6th, 7th, or 8th grade. A classroom teacher generally directed the industrial arts studies. Lack of tools, space, interest and trained teachers limited the program. Teachers in the area favored expanding industrial arts.

3141. NEWHAUSER, RUTHERFORD B. (Masters). *Correlating Industrial Arts and Academic Subjects through Transportation and Communication.* Marquette University, 1939.

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3142. NICHOLS, DWIGHT WILSON. *Resource Units in Industrial Arts Teacher Education, With Special Reference to the Development and Use of a Graphic Arts Unit on Book Publishing for Junior High Schools.* Ph. D., 1955, The Ohio State University. 250 p. Library, The Ohio State University, Columbus.

Purpose: To explore the concept of "resource units" as content and method in the preparation of Junior high school teachers of industrial arts and feature the development of a resource unit from the graphic arts industry called, *Books.*

Source of Data: Data were obtained by the identification of hypotheses and their development through a study of the literature. These were based on postulates that have been presented by such leaders as Richards, Bonser, Warner, and others.

Findings and Conclusions: The profession needs to raise its sights concerning subject matter penetration and method, especially concerning the development and use of resource units. The rapidly evolving technology has progressed far beyond the practice of the industrial arts profession which mean that a coordinated program of curriculum research needs to be organized. The industries themselves need to be stimulated to participate more widely. Reorientation of technical and professional courses as well as refresher courses on bachelor's and master's level are needed. Literature needs to be developed on a research basis. One section of the resource unit on *Books* includes a total of thirty-three specific suggestions ranging from a variety of manipulative activities to a vocabularly analysis. It is rich in interest as well as integrational outcomes such as history, language, mathematics, science, vocation and industrial orientation.

3143. NORDELL, DEAN R. *Improving Instruction in Industrial Arts.* M. A., 1949, University of Minnesota. 126 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To improve the act of presentation, the demonstration, the physical product and the prestige of industrial arts work through a study of methods, techniques and aids.

Source of Data: Location and listing of devices and procedures that will increase interest in industrial subjects.

Findings and Conclusions: The study covers four aspects: Routine and variety in class conduct, variety in instruction, vitalizing class presentation, teaching en masse. Appendices includes work sheets and study qustions for metal work, lists of terms, maxims and sayings adaptable to idustrial arts, and some common words used in mechanical drawing with their definitions. Thirty-three illustrations.

3144. NORTHQUEST, OTTO ALBIN (M. S.). *An Experiment in Seventh Grade Mechanical Drawing to Determine the Achievements of Pupils in Small Versus Large Classes.* Iowa State College, 1936. 56 p.

A study comparing the results obtained when two classes, numbering twenty-two and forty-four respectively, of junior high school students were taught mechanical drawing by means of the same teaching methods and the same course of study.

3145. OGG, GERALD R. *Objectives Versus Practices in Industrial Arts.* M. Ed., 1951, Colorado Agricultural and Mechanical College. 103 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the extent to which the objectives of industrial arts as expressed at the professional level influence industrial arts in general education.

Source of Data: Data were obtained through questionnaires sent to industrial arts teachers of 36 schools in Kansas, Nebraska, Iowa, and Illinois.

Findings and Conclusions: In the opinion of teachers, objectives related to personal-social traits were being satisfied by more schools than those pertaining to manipulative skill and technical knowledge. Schools of larger enrollment tended to satisfy the objectives more fully than smaller schools. Activities involving correlation with other departments and other school activities received little emphasis.

3146. PALMER, GEORGE A. *Plan for Training Instructors of Related Information.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 71 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a program for training craftsmen to teach related trade information.

Source of Data: Data were obtained from available literature on the subject and from interviews with state vocational teachers.

Findings and Conclusions: Very limited material is available on the preparation of the craftsman as an instructor of related trade information.

3147. PARKS, ORRIN RALPH. *Probability of Industrial Education Graduates Entering Teaching or Non-Teaching Vocations.* M. S., 1952, Iowa State College. 38 p. Library, Iowa State College, Ames.

Purpose: To identify differences that may exist between graduates who select teaching and non-teaching positions, and to ascertain the predictive value of various tests, high school marks, and college grades forecasting vocational preference.

Source of Data: Data were collected from the records of 164 industrial education graduates of Iowa State College during the years 1947–1952. Analysis of variance, biserial correlation, product-moment correlation, discriminant function, and multiple biserial correlation techniques were used.

Findings and Conclusions: Five variables found to differentiate the two groups were: college grade average, college economics grades, Owens-Bennett score, and persuasive and scientific interest scores on the Kuder vocational interest inventory.

3148. PATTERSON, HOWARD V. (M. A.). *Observation and Practice Teaching in Manual Arts and Trade Training.* University of Minnesota, 1932. 122 p.

A comparative study of 109 teacher training institutions for the purpose of discovering practices, trends, and unique plans employed in observation and practice teaching in industrial subjects.

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3149. PAWELEK, STANLEY J. (Ed. D.). *An Analysis and Evaluation of Certain Functional Training Characteristics of Teacher Preparation in Industrial Arts.* Pennsylvania State College, 1941. 152 p.

A survey conducted through 100 institutions which prepare industrial arts teachers. Thirty organizational aspects of teacher preparation were studied according to current practice, judgments of best practice, and principles arrived at experimentally.

3150. PAYNE, JAMES STANLEY. *Industrial Arts as a Vitalizing Factor in Secondary Education.* M. A., 1951, The Ohio State University. 84 p. Library, The Ohio State University, Columbus.

Purpose: To identify industrial arts activities that may be used to vitalize secondary education.

Source of Data: Data were obtained by a questionnaire sent to teachers of industrial arts in Ohio.

Findings and Conclusions: Areas of secondary education for which projects had been made by industrial arts classes were: English, Latin, dramatics, mathematics, athletics, music, science, history, physics, biology, home economics, driver education, geography, and chemistry. Many projects made for the school in general, such as signs, bulletin boards, and repair work.

3151. PEASE, GEORGE O. ***An Analysis of Carpentry for Terminal Education in Technical Institutes.*** **M. S., 1949, The Stout Institute. 100 p. Library, The Stout Institute, Menomonie, Wisconsin.**

Purpose: To compare the material that is now being given with that which should be presented for terminal education in carpentry.

Source of Data: Normative survey used to make a survey of offerings in the field; also trade and job analysis. From more than 200 catalogues received, 44 that contained course descriptions of carpentry and building trades were selected for analysis.

Findings and Conclusions: The curricula of the technical institutes are restricted and intensive because the student is in residence a relatively short time. The carpentry offerings of technical institutes are a portion of the training required for wood technicians. The author of this study recommends that: This study be used by administrators and instructors in developing carpentry course content for use in technical institutes. Standards be developed to correlate the carpentry course content in junior colleges and technical institutes with apprenticeship standards. Studies be made of other industrial education courses in technical education courses in technical institutes.

3152. PEET, VINCENT COOPER (M. A.). ***Methods of Teaching General Aeronautics in the Public Secondary Schools of Southern California.*** **University of Southern California, 1932. 151 p.**

A study concerning the methods of instruction in high school and junior colleges of Southern California.

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3153. PEITHMAN, ROSCOE EDWARD. ***The Preparation of Teachers of Industrial Arts in the Area of Electricity and Electronics.*** **Ed. D., 1955, Oregon State College. 155 p. Library, Oregon State College, Corvallis.**

Purpose: To ascertain the preparation needed for teaching electricity and electronics in the industrial-arts program of the secondary school.

Source of Data: Data were obtained by questionnaires sent to secondary school and college teachers of electricity and electronics.

Findings and Conclusions: Preparation in both electricity and electronics should be required of all students who plan to teach industrial arts in the secondary school. Three semester hours of general electricity followed by three semester hours of general electronics are recommended for teaching in the electrical area of the comprehensive general shop, and eighteen semester hours in electricity and electronics are recommended for those students preparing to teach in the limited general shop and/or the unit shop. Recommendations are made covering: courses which should be included in a program for preparing teachers in the electrical area; the content of the courses in electricity and electronics; and the supporting fields of study in mathematics and physical science.

3154. PENNINGTON, JOHN DEWEY ***Jr.*** ***Disciplinary Problems in Industrial Arts Classes.*** **M. S., 1953, Louisiana State University. 102 p. Library, Louisiana State University, Baton Rouge.**

Purpose: To identify and describe the disciplinary offenses that occurred in industrial arts classes in Louisiana during the first semester of the 1952–53 school year.

Source of Data: Data were secured from 110 white industrial arts teachers in Louisiana.

Findings and Conclusions: Sixty-three per cent of the responding teachers were in favor of amending the Louisiana school discipline law which prohibits corporal punishment. Sixteen year old pupils, and pupils in the ninth grade committed most offenses. "Clowning" was the most often listed offense occuring generally during the first ten minutes of class. Stealing occurred least. The simple conference method of correction was used most.

3155. PERONA, JAMES PETER. ***Some of the Problems Confronting a Beginning Industrial Arts Teacher in a Small School.*** **M. Ed., University of Rochester, 1948. 66 p.**

A study of the problems which confront a beginning industrial arts teacher, such as selection and purchasing of equipment, shop discipline, safety instruction, and aims and content of course of study.

3156. PERRY, WILLIAM H. (Masters). *Practical Values of Industrial Arts in a Junior High School,* University of Cincinnati, 1937.

3157. PETRY, WALTER SMITH (M. A.). *Junior and Senior Industrial Arts Class Trips: A Study of Policies, Practices, and Trends in Columbus, Ohio.* Ohio State University, 1932.

A description of the opinions of school personnel, the general public, and business personnel regarding the educational value of field trips. The administrative problems and procedures involved are discussed.

3158. PINSON, ROBERT (M. S.). *A Study of the Scholastic Achievement Made by the Pupils in the Language and Industrial Arts Courses in the High Schools of Texas.* A & M College of Texas, 1930. 69 p.

A study of the grades made in high school by students taking the language curriculum in contrast with those taking the industrial arts curriculum. Limited to the 1929–1930 freshman class at Texas A & M College.

3159. PITCHER, MELVIN. *Parent and Student Opinions of Industrial Arts Projects for the MacDowell Elementary School.* M. Ed., 1953, Wayne University. 19 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To ascertain student needs in elementary industrial arts and the type of projects required to meet their needs.

Source of Data: Data were obtained by questionnaires distributed to students, parents, and teachers.

Findings and Conclusions: Projects were chosen from the suggestions of students and designed to be constructed in the time allotted for each activity. Drawings of these projects are found in the appendix of this study.

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3160. PORTER, HAROLD WILLIAM (Ph. D.). *An Investigation of Instructional Material Needs for Machine Shop Training.* Purdue University, 1948. 164 p.

A study making use of questionnaires and checklists for the purpose of developing a pattern for a suitable textbook which would insure psychological adequacy in terms of such factors as reading level, technical vocabulary, and proper use of illustrations.

3161. REED, GEORGE WASHINGTON (Masters). *A Functional Study of the "Handy-man" Industrial Arts Objectives.* Ohio State University, 1933.

3162. REED, GLADYS E. (Masters). *A Study of Graphic Arts Materials and Techniques Appropriate to the Secondary School.* Louisiana State University, 1942.

3163. RICHARDSON, CHARLES G. *An Analysis of An Entering Student Group.* M. S., 1952, Stout State College. 100 p. Library, Stout State College, Menomonie, Wis.

Purpose: To make a detailed analysis and presentation of several kinds of data which reveal the socio-economic and intellectual character of an entering student group at Stout State College.

Source of Data: Data were obtained by a questionnaire, an analysis of the freshman test data, and by comparison of grade point averages of students.

Findings and Conclusions: For comparative purposes it is recommended that this study be used as a basis for future studies of entering groups at Stout State College. Another possibility would be to follow up this particular group in its progress through the curriculum and as teachers and workers thereafter.

3164. RINGOLD, HOWARD WOOD (M. S.). *Initial Problems of Beginning Teachers of Industrial Arts.* Oregon State College, 1942. 122 p.

An analysis of the problems which confront the beginning teachers in industrial arts. The pedagogical problems as well as the problems due to inadequate physical facilities are considered.

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3165. RISHER, CHARLES G. *Relationship Of Scholastic Attainment To Rated Success As A Beginning Industrial Arts Teacher.* Ed. D., 1953, University of Missouri. 79 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the relationship between undergraduate marks made in industrial arts teacher education and subsequent success as a beginning industrial arts teacher.

Source of Data: From official records in 24 colleges in 14 states, data on scholastic attainment were obtained for 190 beginning teachers who had graduated in 1950 and were teaching in 29 states. Ratings on teaching success were obtained from the immediate supervisor on a scale constructed for the purpose. Correlation techniques were used in handling the data.

Findings and Conclusions: A low but positive correlation was found to exist between *rated success* of beginning industrial arts teachers and college *marks made* in the different areas, as follows: professional courses in education—.20; technical courses—.21; academic courses—.22; all undergraduate courses—.34. Although undergraduate scholarship in industrial arts teacher education and subsequent success as a beginning teacher tend to vary together, high scholastic marks taken alone provide little guarantee of success as a teacher. Other factors such as personality, interest application, enthusiasm, etc., operate in successful teaching. The sum total of a teacher's college marks are a better predictor of teaching success than those made in any one area.

3166. ROBERTS, THOMAS H. (M. S.). *Status of Indiana Industrial Arts Teachers in 1946.* Iowa State College, 1947. 51 p.

Investigates the status of 543 Indiana industrial arts teachers in 1946 as related to seventeen items including: training, teaching experience, type of position held, salary, and subject combinations taught by teachers.

3167. ROE, WILLIAM H. *A Study of the Reimbursed Vocational Programs in Michigan.* (A Special Study). Office of Vocational Education, University of Michigan. 24 p. Not available for distribution.

Purpose: To provide basic data for those types of school districts which are credited by the Finance Department of the Department of Public Instruction with offering secondary education (including grades 7–14). To present data which readily compares one group of schools (according to size) with another. To supply facts whereby those educators concerned with occupational training may know the range in size of high schools in Michigan and how those high schools of one size compare with those of another in the offering of vocational programs.

Source of Data: The study divided the secondary school districts of Michigan into two groups of 18 according to enrollment and equalized valuation, as a means of equitable comparison, and indicated the number and type (i. e., Agricultural, Homemaking, Business Education, and Trade and Industrial) of vocational programs offered in each group.

Findings and Conclusions: This study is based upon existing conditions. Through presentation of enrollment and financial data the amount and type of occupational training schools of similar size now offered in Michigan has been shown. On the basis of present practices certain conditions have been noted. It would appear that most schools with enrollments below 150 and valuations below $1,500,000 are too small to offer occupational training except in unusual circumstances. Most schools with enrollments from 150 to 300 and valuations from $1,500,000 to $3,500,000 offer either classes in vocational agriculture or homemaking without too much of a strain on their finances and economical use of class size; however, such schools experience difficulty in offering more than one program in vocational education and probably do so only with exceptional effort and educational leadership. Schools with enrollments from 350 to 800 and equalized valuations from $3,500,000 to $12,000,000 have possibilities of offering a complete program of occupational training. Yet, it would seem that these possibilities must be explored more thoroughly by educational leaders and administrators so that these schools can be encouraged on a sound basis to expand their offerings.

3168. ROST, GROVER F. (Masters). *Standards and Requirements for Industrial Arts Teachers.* University of Wisconsin, 1930.

3169. ROWAN, WILLIAM D. (Masters). *General Shop Problems Peculiar to the Small Town and One Teacher Departments.* Wayne University, 1942.

3170. RUCH, LAWRENCE EDWIN (M. S.). *A Study of Grade Distribution in Large and Small Class Groups, Covering the Same Students and the Same Classwork.* Oregon State College, 1937. 53 p.

A study to determine the relationship between grades given in small groups and those given for the same work to students of the same class in a large group, and, in addition, to set up a standard measuring device which will assist in grading the beginning woodworking project covered by the study.

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3171. RUMPF, EDWIN L. *A Basis for the Selection of Vocational Industrial Education Teachers for Employment*

***in Pennsylvania.* Ed D., 1954, The Pennsylvania State University. 233 p. Library, The Pennsylvania State University, University Park.**

Purpose: To establish a basis for the selection of vocational-industrial education teachers with regard to employment for the all day programs in Pennsylvania.

Source of Data: Data were secured from a review of literature in the field, by a jury of educators considering the selection of teachers, the present status of vocational-industrial teachers in Pennsylvania, and teacher rating by local directors.

Findings and Conclusions: The selection factors for the shop teacher which had some correlation with teaching performance were the age at which the teacher entered the profession, the teacher's present age, years of industrial experience, years of teaching experience, and the number of college credits earned. The four factors which appeared to have some significance for related subjects teachers are years of teaching experience, the teacher's present age, the number of college credits earned, and the age the teacher entered the profession. A prediction equation indicates the probably potential of the shop teacher. A similar equation determines the probable potential of the related subjects teacher.

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3172. RUSSELL, ELLSWORTH M. *An Analysis of Areas, Units, Operations and Related Information of Industrial Arts Metalwork for Teacher Education.* Ed. D., 1950, Pennsylvania State College. 379 p. Library, Pennsylvania State College, State College.

Purpose: To survey outstanding secondary school teachers of metal work, teacher educators in industrial arts metalwork and industrial arts supervisors who were metalworking teachers to determine their evaluations of the operations and related information of 10 areas of industrial arts metal work for teacher education.

Source of Data: Each selected secondary school teacher and teacher educator was asked to rate, according to their importance in teacher education, prepared items of operations and related information for the areas that he was teaching. In addition, the secondary school teachers were to check those items included in their courses and to give the chief objective being stressed. Returns were divided according to the type of school, type of shop, and objective for each area. The industrial arts supervisor participants rated similar lists. Correlations were calculated to determine relationships. The areas studied were Art metal, bench metalwork, forging, foundry, jewelry, machine shop, sheet metal, spinning, arc welding, and gas welding.

Findings and Conclusions: The aims being stressed seemed to have no effect upon the operations of items of information included in the secondary school courses. The outstanding secondary school teachers of industrial arts metalwork, teacher educators of industrial arts metalwork and industrial arts supervisors who had metalworking experience agreed very well as to the importance of the operations and items of information of the 10 areas for teacher education. The same respondents seemed to believe that work in jewelry and spinning should be elective in teacher education but the other areas should be required. The lists of operations and related information for each of the 10 areas were arranged in order of importance in teacher education as established by the 3 groups of respondents.

3173. SAARE, E. JOHN. *Internship in the Duval County Industrial Arts Department.* M. A. in Ed., 1950, University of Florida. 87 p. Library, University of Florida, Gainesville.

Purpose: To provide a flexible, yet standard procedure for preparing industrial arts interns in the Duval County public schools.

Source of Data: The proposal is a result of individual study, coupled with information gained from directing teachers, graduate students, industrial arts interns, and specialists of the intern program at the University of Florida.

Findings and Conclusions: Interns must be ready to contribute, through industrial arts, to the cause of general education. A knowledge of general objectives, tools, equipment and materials is an important factor toward building confidence in the intern. The need for an improved over-all education program must be recognized. The period of experience for the intern in the cooperating school is a vital one. The intern should have a knowledge of certification and placement procedures in the State of Florida.

3174. SAARE, E. JOHN. *Internship in the Duval County Industrial Arts Department.* M. Ed., 1950, University of Florida. 87 p. Library, University of Florida, Gainesville.

Purpose: To outline a flexible, yet standard procedure for preparing industrial arts interns in the Duval County public schools.

Source of Data: Data were secured from various educational groups to find solutions to problems of teaching the intern in industrial arts.

Findings and Conclusions: The report contains a plan of action for the intern while under the supervision of the directing teacher.

3175. SAUDER, JOHN LEVI (M. A.). *Industrial Arts Teacher Training for the State of Virginia.* University of Virginia, 1947.

An analytical study of industrial arts teachers who were certified and who were teaching in Virginia during the 1945–46 school term. The author concludes that Virginia needs an industrial arts teacher training program.

3176. SAVAGE, EROS MARSHALL (M. S.). *An Investigation of the Teaching of Related Technical Science in the Smith-Hughes Vocational Schools of the United States.* University of Southern California, 1936. 84 p.

An investigation to determine if related subjects should be taught as a part of vocational training, and what methods are most effective.

3177. SAYOVITZ, JOSEPH JOHN (M. S.). *Preparation and Duties of Industrial Education Instructors in Minnesota.* Iowa State College, 1947. 63 p.

A survey concerning the educational background, previous teaching experience, and the type of courses taught by each instructor and the number of instructors who taught in both the trade and industrial arts program.

3178. SCHELHAS, LORENZO C. *An Investigation into the Industrial Arts Program in the Public Schools of Evanston, Illinois.* M. A., 1949, University of Michigan. 42 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To discover the extent to which the work done in the industrial arts department of the Evanston Public Schools is training youth to meet the objectives the department has recognized as being of value in the training of Evanston youth.

Source of Data: A study of the literature in the field was made to discover the most commonly accepted objectives of the industrial arts department. These were submitted to teachers to discover specifically the objectives they feel they are trying to achieve. The work of the department was evaluated in terms of the extent to which the latter objectives were being achieved. Information was obtained from the Chamber of Commerce and United States Employment Service in connection with occupational opportunities for graduates. A questionnaire was filled out by author on the basis of personal interviews with teachers and staffs concerned.

Findings and Conclusions: The objectives which the teachers felt they were trying to achieve were: Knowledge of industrial procedures, consumer knowledge or related information, skills and technique, exploring opportunities, appreciation, leisure-time interests, vocational guidance, "handy-man" activities, planning, desirable habits and attitudes, pride and interest in accomplishment, prevocational purposes, social-economic cooperation, self-expression and problem-solving attitudes, and vitalization of academic subjects.

3179. SCHLIEP, CARL J. *A Short Method of Analysis and Its Applications to the Maintenance Electricians' Trade.* M. Ed., University of Cincinnati, 1937. 92 p.

A study to develop a short method of trade analysis that can be made and used by a beginning teacher of the mechanical trades and to apply this method to the maintenance electricians' trade.

3180. SCHORLING, HORACE OREN (M. S.). *A Handwork Activity Program for Elementary Schools.* Oregon State College, 1947. 76 p.

An attempt to determine what constitutes a good elementary handwork program. It suggests tools, materials, activities, and projects to correlate with the major units from kindergarden through grade six.

3181. SCHREINER, RAYMOND A. (M. A.). *A Descriptive Analysis of the Teacher of Industrial Arts in the Secondary Schools of Nebraska.* Colorado State College of Education, 1938. 146 p.

A personnel study which includes professional preparation, major and minor, trade experience, salary, school size, subject combinations, extra-school activities, and hobbies.

3182. SCHROETER, FRANK E. *Analysis of In-Service Training for Industrial Arts Teachers.* M. S., 1950, The Stout Institute. 115 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To make an analysis and reveal the current philosophy, conditions, and trends in the in-service training of teachers; to indicate devices that are recommended by experts for accomplishing a workable in-service program;

to list criteria for evaluation of conditions essential to teacher growth; to list criteria for evaluating techniques employed in the in-service education of teachers; and to present a suggested plan or program for the upgrading of industrial arts teachers.

Source of Data: The method employed was a documentary survey of recent books, magazines, and educational publications which have definite reference to the subject of this study.

Findings and Conclusions: This study may be used as an aid in developing an in-service education program. It may be used as a reference in pre-service, in-service, and self-improvement training. The administrator who is interested in promising techniques for in-service education may use this study as a basis for his selection. The educator who is interested in desirable in-service training techniques recommended by experts in the field should study the references which are listed in this study. The results of this limited study indicated a need for broader study of this subject, with the use of more references.

3183. SCHUMANN, ARTHUR MILTON. *Masonry—A Content Study with Implications for Industrial Arts.* M. A., 1950, Ohio State University. 83 p. Education Library, Ohio State University, Columbus.

Purpose: To show that brick and stone masonry can be taught in the industrial arts laboratory and to reveal that the occupations have sufficient interesting and useful content to make them educationally and technically profitable.

Source of Data: A review of the literature and the techniques and applications of masonry in the industrial world.

Findings and Conclusions: It is possible to teach an orientation of the techniques and background of the masonry trades in a industrial arts laboratory. The teaching will contribute to the established objectives of industrial arts, including: Vocational interests, consumer literacy, social understanding, and cultural relationships of the students, and thereby orient them more fully into the present technological environment.

3184. SCHWEERS, REX RAYMOND (M. A.). *Problems on the Steel Square for High School Shop Students.* Colorado State College of Education, 1933. 69 p.

A compilation of practical shop problems on the steel square for high school mathematics shop students.

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3185. SCOBEY, MARY-MARGARET. *Industrial Arts for Elementary Teachers.* Ed. D., 1952, Stanford University. 226 p. Library, Stanford University, Stanford, Calif.

Purpose: To ascertain the industrial arts education of elementary school teachers.

Source of Data: Data were obtained from a review of literature and conferences with elementary education leaders. An examination of personal needs of elementary teaching credential candidates was made by using 7 instruments, given to 209 students in 3 institutions.

Findings and Conclusions: Course offerings and objectives vary between institutions and do not coincide with the industrial arts objectives as commonly known. Elementary teachers need to understand and apply the principle that industrial arts is the "vehicle" used to provide motivation for content. Teacher training candidates were vague in their understanding of industrial arts and what, why, and how to use this process in the elementary grades. Many teacher training experiences are listed which would provide a broader basis of manipulative experiences and understandings.

3186. SCOTT, CHARLES M. (M. A.). *The Pre-College Background of Industrial Arts Majors and Minors at the Colorado State College of Education 1939-40.* Colorado State College of Education, 1940. 226 p.

A survey of the pre-college background of majors and minors in regard to their reason for selecting industrial arts, high school work, extra-curricular activities, economic status of parents, and sizes of schools attended.

3187. SCOTT, RAYMOND C. (M. Ed.). *The Application of the Principles of Design to Modern Living Room Furniture.* Colorado Agricultural & Mechanical College, 1947. 106 p.

A study of the application of principles of design to the construction of modern living room furniture. Principles are defined and applied to specific units of modern furniture. Illustrations are included and projects for industrial arts classes are suggested.

3188. SEVILLA, GREGORIO (M. Ed.). *Salaries, Experience, and Training of Teachers in Philippine Schools That Give Vocational Instruction.* Wayne University, 1941. 80 p.

A survey which determines the relation of industrial arts and vocational education teachers to the Philippine educational system as a whole, and makes recommendations for changes.

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3189. SHACKELFORD, RICHARD W. *Problems of the Beginning Industrial Arts Teacher.* **Ed. D., 1955, University of Florida. 163 p. College of Education, University of Florida, Gainesville.**

Purpose: To help prospective teachers with the techniques and insights that will minimize the effects of problems the beginning industrial arts teacher meets.

Source of Data: Data were secured through correspondence and visits with industrial arts teachers, department heads, and faculty members training teachers.

Findings and Conclusions: This study shows the problems industrial arts teachers must be prepared to meet.

3190. SHAPIRO, JEROME. *An Experimental Study of the Immediate Effect of Arbitrarily Imposed Success or Failure on the Interest in a Given Motor Task.* **M. A., 1951, University of Michigan. 40 p. Library, University of Michigan, Ann Arbor.**

Purpose: To study the immediate effect of success or failure on the interest in a certain motor task and the relationship between the strength of experience and immediate interest.

Source of Data: Data were obtained from a group of 32 children who were exposed to one of four experimental groups and were subjected to an imposed experience of success or failure in a specific motor task. They were then asked to answer some questions designed to test their interest in the task. Their answers were tabulated to indicate similarities and differences that occurred due to experimental stimulation.

Findings and Conclusions: The unsuccessful subjects had a greater tendency than the successful subjects to feel that their friends would view the task favorably. After a moderate degree of success or failure the subjects considered their performance better than the subjects having a strong experience of either success or failure. After a moderate experience of either success or failure the subjects were more willing to continue the activity either immediately or at a future date than the subjects having a strong experience of success or failure.

3191. SHAW, JOHN A. *Teaching Design in Industrial Arts in the Public Schools of Ohio.* **M. S. in Ed., 1950, Bowling Green State University. 81 p. Library, Bowling Green State University, Bowling Green, Ohio.**

Purpose: To investigate the extent of the use of the principles of design by the pupils in planning their projects; to determine to what extent the principles of design are taught to aid the pupils in the selection of the products of industry; and to obtain information on what should be included in functional design in industrial arts.

Source of Data: The data of this study were obtained from a review of the literature of art and industrial arts and from a survey by questionnaire to the industrial arts instructors in the public schools of Ohio.

Findings and Conclusions: The study of the literature of art and industrial arts reveals that much has been written about design but little about methods of teaching design. A limited amount of design is being taught in the industrial arts departments of most schools. Design, in 84 percent of the cases, is integrated with the shop work. The principles of design are generally used by the pupils when planning their projects. Some of the principles of design are taught to aid the pupils in a wise selection of industrial products. Problem-solving and judgment abilities are not increased when the various considerations of design are used.

3192. SIEGNER, CLARENCE V. *Community Resources as a Means of Teaching Related Information in Industrial Arts.* **M. S., 1950, Oregon State Library. 125 p. Library, Oregon State College, Corvallis.**

Purpose: To survey community resources of Seattle, Washington which are available to the industrial arts teacher for teaching related information.

Source of Data: Observation, interviews and analysis of printed material.

Findings and Conclusions: Teachers used the community resources to bring closer relationship between the school and the community. Studies should be made by students of industries and occupations. Student committees should analyse and report thoroughly on new resources, or new developments with the present resources. Related information in mimeographed or printed forms which can be obtained from commercial firms in the community should be distributed to the students for classroom use.

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3193. SIRO, EINAR E. *Preparation and Up-Grading of Industrial Education Personnel.* Ph. D., 1949, University of Minnesota. 642 p. Library, University of Minnesota, Minneapolis.

Purpose: To provide an over-all picture of industrial teacher education with its many ramifications, and to provide a brief description of its development.

Source of Data: Data were obtained from a canvass of related literature, study of descriptive catalogues and course schedules, and questionnaires completed by Chief State School Officers, Heads of Industrial Education Departments in colleges and universities, and State Supervisors of Industrial Education.

Findings and Conclusions: The study revealed a need for clearer definition of objectives, standardized titles of departments, and provision of both general and unit shops; more offerings of course construction techniques at the undergraduate level; a broad list of manipulative areas accepted by most institutions; analysis of teacher duties to determine course content; observation and practice teaching in trade classes for vocational-industrial education majors; better selection of staff; in-service training program; better defined bases for promotion; better selection of candidates; an acceptable plan for the evaluation of trade experience; standardized certification; and, a more flexible policy of vocational-industrial teacher certification.

3194. SMITH, ALFRED P. (M. S.). *A Comparative Study of Industrial Arts Students and College Course Students at Indiana State Teachers College.* Indiana State Teachers College, 1936. 37 p.

A comparison of the achievement of industrial arts students and students majoring in other subjects on the basis of records in English, education, mathematics, and science. Students were selected from each of four successive years at Indiana State.

3195. SMITH, LOREN W. *A Study of the Comparison of Academic, Special, and Industrial Education Grades in the Ponca City Public Schools.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 129 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To check the effectiveness of grouping seventh grade students on the basis of elementary school achievement.

Source of Data: Data were obtained from school records for boys in the class of 1945–46 in Ponca City Junior High School.

Findings and Conclusions: The needs of pupils can be more nearly satisfied by the method of academic achievement grouping. Students with lower I. Q.'s tend to work more nearly capacity than students with higher I. Q.'s.

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3196. SMITH, ROBERT E. (Doctors). *A Study of the Habits Acquired by Students of Industrial Arts in Measuring or Judging.* Ohio State University, 1928.

3197. SNOBLIN, KENNETH A. *An Investigation and Appraisal of Some Industrial Arts Techniques for the Teaching of Ninth Grade Mathematics.* M. Ed., 1953, University of Florida. 52 p. Library, University of Florida, Gainesville.

Purpose: To discover the results of the use of industrial arts techniques in the teaching of mathematics at the ninth grade level with the thought of possible correlation of the two subjects.

Source of Data: Data were obtained from the cumulative records of the students concerned, along with the results of specific tests given to all the students in the class.

Findings and Conclusions: The industrial arts group was better able to cope with a given mathematics problem (square root tables) than the group which had not used the table except when needed.

3198. SODERBERG, GEORGE A. *Modern Finishing Materials and Methods.* M. A., University of Minnesota, 1948. 171 p.

A study of the origin and development of new and old materials used to produce protective coatings; methods of procedure for certain types of finish; proper use and care of equipment; troubles and remedies.

3199. SPANOVICH, JOSEPH FRANK. *Industrial Arts in the Elementary School, A Study of Its Nature and Development.* M. A., 1955, the Ohio State University. 83 p. Library, the Ohio State University, Columbus.

Purpose: To provide a descriptive account of the nature, purpose, and extent of industrial arts at the elementary-school level.

Source of Data: Data were obtained by library research, personal interviews, and observations of current programs.

Findings and Conclusions: Industrial arts activities should be integrated and not organized as a special subject in the elementary curriculum. An effective industrial arts program in the elementary grades can interpret society at the child's level, help him to understand and adjust to a rapidly changing technological culture, and develop desirable citizenship.

3200. SPAULDING, BENJAMIN W. (M. A.). *A Compilation of Related Information Material in Industrial Arts Field, With Special Emphasis on Woodwork.* Stanford University 1936. 183 p.

This collection of related materials for use in woodworking includes information on the application of related material to the teaching of industrial arts, woods, woodworking supplies, furniture making, cabinetmaking, carpentry, tools, and painting and wood finishing.

3201. STAHL, GLENN WESLEY (M. A.). *The Professional Preparation and Status of the Teachers of Industrial Education of North Carolina.* Colorado State College of Education, 1939. 117 p.

A personnel study of the industrial arts teachers of North Carolina as determined by professional education, major and minor, trade experience, teaching experience, size of school, salary, and subjects taught.

3202. STILLMAN, CLARENCE GEORGE. *A Study of the Advisability of Establishing Thirteenth and Fourteenth Years in the Educational System of South Bend, Indiana.* M. S., 1949, Purdue University. 53 p. Library, Purdue University, Lafayette, Indiana.

Purpose: To determine the post-educational needs, particularly of a vocational nature in the South Bend city schools.

Source of Data: An interview sheet was prepared and a pilot study made to determine the validity of the sheet. These interviews were then carried on with graduating seniors and industrial executives. Five hundred and eighty-seven seniors were included in the interviews. Sixty-six percent of these were planning to take employment where additional training was to be offered. Forty-three percent planned to take up college work several years later, meanwhile were seeking employment.

Findings and Conclusions: The survey showed a definite need for additional training. Local persons in general are not satisfied with the types of programs being offered. Business is concerned with the lack of preparation for beginning employees. Modern industry has created a new type of job which lies between the professions and non-technical jobs. No common term is used throughout the country to designate this type of post-high-school education.

3203. STUART, HARLAND (Doctors). *The Improvement of Vocational Education in the Philippine Islands.* Harvard University, 1933.

3204. SUMADA, MITSUGU. *Industrial Arts in the Modern Elementary School.* M. A., 1954, University of Minnesota. 108 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To summarize information on the developmental characteristics of the elementary school child, and to point out the values of industrial arts in the elementary school.

Source of Data: Data were obtained from pertinent literature on the modern elementary school and industrial arts in general education.

Findings and Conclusions: The teaching of industrial arts plays a vital role in meeting the physical and mental needs of the elementary school child. Modern elementary school philosophy and practice provides for an integrating industrial arts program.

3205. THOMAS, MAXWELL S. (M. Ed.). *Annual Itinerant Teacher Training Program for Negro Trade and Industrial Teachers of Florida.* Colorado Agricultural & Mechanical College, 1945. 118 p.

A survey of trade teachers, co-ordinators, principals, and local supervisors to determine what should comprise the annual itinerant teacher training program for Negro trade and industrial tecahers in Florida. Duties and responsibilities of the teachers are reviewed and the findings are analyzed.

3206. THOMAS, T .A. *Effect of Trade and Industrial Program on Student Withdrawals.* M. Ed., 1952, Colorado Agricultural and Mechanical College. 55 p. Library, Colorado

Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the effect of a trade and industrial program on student withdrawals.

Source of Data: Data were obtained from an analysis of school records, and from a follow-up of students who dropped out of school.

Findings and Conclusions: During the three years the trade and industrial program was in operation, there was a decided decrease in drop-outs. All junior and senior students enrolled in trade and industrial courses remained in school. Intelligence apparently was not a factor in a student's withdrawal from school.

3207. THOMPSON, *Jr.*, ERSKINE E. ***An Inquiry Into the Need For Industrial Arts in General Education.*** **M. A., 1955, Middle Tennessee State College. 42 p. Library, Middle Tennessee State College, Murfreesboro.**

Purpose: To present some of the needs and methods of industrial arts in general education.

Source of Data: Data were secured from books, magazines, periodicals, industrial arts teachers, and leaders in industrial arts education.

Findings and Conclusions: Industry asks that basic skills, concepts, information, work habits, and character traits, be instilled in the student. There is a definite need for industrial arts in the general education curriculum. Mechanical drawing should be given as an introductory course.

3208. THOMPSON, EUGENE E. ***Teaching Problems in Industrial Arts and Their Suggested Solution.*** **M. S., 1952, Bowling Green State University. 126 p. Library, Bowling Green State University, Bowling Green, Ohio.**

Purpose: To ascertain and classify the teaching problems of present day industrial arts teachers.

Source of Data: Data were secured by a survey of the literature of industrial arts and a questionnaire sent to three hundred teachers in northwestern Ohio.

Findings and Conclusions: There is a wide variety of industrial arts teaching problems. Teachers use a large number of methods in solving their problems. The number and extent of teaching problems decrease sharply after ten years of teaching experience.

3209. TIERNEY, WILLIAM FRANCIS. ***Land Transportation: A Study of Pupil Activities and Teaching Implications for Industrial Arts Programs in Secondary Schools.*** **M. A., 1949, Ohio State University. 150 p. Educational Library, Ohio State University, Columbus.**

Purpose: To present suggestions for pupil activities that will implement the land section of a modern transportation program.

Source of Data: Over 50 illustrations were selected through the use of professional criteria after examination of about 200 current issues of craft magazines. The items chosen were reproduced by the photo-copy method of reproduction.

Findings and Conclusions: The field of transportation offers many implications for enrichment of industrial arts. There is a wealth of ideas for plans in current issues of craft magazines, directly related to a study of transportation, which might readily be adapted in general shop, woods, and metal laboratories.

3210. TINKHAM, ROBERT A. ***An Introduction to Modern Design for Industrial Arts Teachers.*** **M. A., 1949, University of Minnesota. 118 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To advance a plan (The Design Analysis Method) for designing shop projects and to offer examples of application in real shop situations.

Source of Data: Historical review of design provides industrial arts teachers with modern concepts and methods of developing introductory and modern design in their own classes.

Findings and Conclusions: Too much reliance is placed on imitation and on "set projects." Insufficient imagination, initiative and problem-solving ability are developed.

3211. TOMASULO, MICHAEL C. (Masters). ***Education through Industrial Arts.*** **Rutgers University, 1933.**

3212. TORGENSON, HENRY T. ***A Study of the Crafts Programs and the Training of Those Teaching Crafts in the Junior High Schools of Texas.*** **M. S., 1949, North Texas State College. 57 p. Library, North Texas State College, Denton.**

Purpose: To determine to what extent crafts are being taught in the junior high schools, and the type and extent of training of crafts teachers in the junior high schools of Texas.

Source of Data: A questionnaire was sent to principals followed by another to the crafts teachers.

Findings and Conclusions: Crafts were included in many of the junior high schools in Texas, especially in larger schools. Many teachers of crafts were without training or had limited training in this field. Interests of students and cost of materials were the determining factors regarding crafts being offered in the schools. Leatherwork, ceramics, wood carving, art metal work, and plastics were the most popular crafts reported.

3213. TUFT, LOWELL F. *A Proposed Resource Unit in Cabinet Making for Senior High Schools in Wisconsin.* M. S., 1950, The Stout Institute. 79 p. Library, The Stout Institute, Menomonie, Wisconsin.

Purpose: To construct a sample resource unit in cabinet making for use in the program in industrial arts in the senior high schools in Wisconsin using an analysis of the field of cabinet making which is designed as a guide for committees planning curricula and individuals preparing courses of study.

Source of Data: The study is primarily a survey of literature on resource units, on the objectives of industrial arts, on the philosophies of industrial arts, on the content material for cabinet making, and on evaluation techniques.

Findings and Conclusions: From the material obtained in the survey of literature, a sample resource unit was developed. The unit includes the following blocks: Hand woodwork, machine woodwork, wood turning, and wood finishing. The writer recommends: This study be submitted to the Statewide industrial arts committee of Wisconsin Cooperative Educational Planning Program for evaluation and use. The suggested resource unit be expanded to include a complete set of operation and related information breakdown sheets. A study be made on the evaluation of material in the resource unit. A study be made on new materials and their use in the field of cabinet making, and the area of activities be developed from the standpoint of evaluation and effectiveness in the industrial arts program and as a guidance service.

3214. URSIN, OTTO. *Industrial Education in Norway and Sweden.* M. A., 1949, University of Minnesota. 56 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To compare school types and offerings in industrial education and trade training in Norway and Sweden with that in the United States.

Source of Data: Exchanges with the Norwegian Ministry of Church and State in Oslo and with the Swedish Institute for Cultural Relations in Stockholm.

Findings and Conclusions: A brief summary of current school types and offerings in industrial education comparable to industrial arts and trade training in American schools.

3215. VAN DEUSEN, C. S. (Masters). *Manual Training and Its Place in Rural Education.* Western Reserve University, 1933.

3216. VAN WYEN, ADRIAN. *Program of Industrial Arts Activity in the Elementary Grades and Its Relation to the Training of Teachers.* M. A., Kent State University, 1938. 70 p.

An attempt to determine the worth of industrial arts in elementary grades and its relation to the training of teachers.

3217. VARIS, ANTHONY, *Jr.* *Industrial Arts in the Small High School.* M. S., 1951, Stout State College. 110 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the basic factors which are conducive to a well organized and well managed general shop program.

Source of Data: Data were obtained from a survey of the literature written by leaders in the field of industrial arts and general education.

Findings and Conclusions: Various factors necessary in the organization and management of an efficient general shop program were identified.

3218. VEZZANI, A. A. *A Survey of What Industrial Education Teachers Read in Their Professional Magazines.* M. A., University of Michigan, 1945. 44 p.

The survey was made to investigate the reading habits of vocational and industrial arts teachers; to determine the professional magazines most used by this group; to obtain specific reactions to the magazines; to obtain reactions relative to advertisements; to determine the extent to which teachers use the free services offered through the magazine; to determine the kind of articles which appeal to industrial teachers; to determine the extent to which the articles bring about changes in courses and curriculums; and to determine the extent to which the projects are used by teachers in their classes.

3219. **WALKER, LAWRENCE A.** *Comparative Achievement of Former Pupils in Industrial Education.* M. S., 1950, Iowa State College. 27 p. Library, Iowa State College, Ames.

Purpose: None reported.

Source of Data: School records, questionnaires, and personal interviews provided the sources of data for this study.

Findings and Conclusions: From the study, the null hypothesis that there is no significant difference in the achievement of trade and industrial and industrial arts groups according to annual income and insurance carried, when controlling on junior high school average, year of graduation, and intelligence quotients, could not be rejected.

3220. **WELCH, ROBERT L. (M. S.).** *A Plan for the Efficient Selection and Training of Circuit Teachers for Wisconsin Vocational Schools.* Colorado Agricultural & Mechanical College, 1938. 154 p.

A plan for the selection, induction, and training of circuit teachers and for the extension training of teachers already in service. The difficulties and needs of the teacher are analyzed.

3221. **WETZEL, CLARENCE LUDWIG (M. S.).** *A Course Outline for Training Partial-Time Inexperienced Teachers of Trade Extension Classes in Saint Louis, Missouri.* Colorado Agricultural & Mechanical College. 1942. 180 p.

A study to determine what subject matter should be included in a short intensive teacher-training course designed to train persons whose regular employment is in industry but who, though inexperienced as teachers, are employed as teachers of trade extension classes in the St. Louis Public Evening School. Difficulties of teachers are noted and remedies are suggested.

3222. **WHEELER, RALPH ROSWELL.** *An Industrial Arts Program for the Elementary Schools of Calaveras County, California.* M. S., 1953, Oregon State College. 98 p. Library, Oregon State College, Corvallis.

Purpose: To compare conditions in four counties using a mobile shop with conditions in Calaveras County, and to obtain opinions of specialists as to the advisability and scope of an elementary school industrial-arts program for Calaveras County, California.

Source of Data: Data were secured from published materials and interviews.

Findings and Conclusions: Industrial arts has important contributions to make in rural schools. It has an established place in elementary schools of the 8–4 plan. The mobile shop has made important contributions to industrial arts in rural communities. The content below grade 7 is usually integrated with social studies. Industrial arts courses on the elementary school level should be coeducational.

3223. **WHEELER, RODNEY M.** *A Proposed Industrial Arts Program for the Sixth Grade of the Petronila Independent School District.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 44 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To present an industrial arts program of the laboratory of industries type for sixth grade boys of the Petronila Independent School District.

Source of Data: Data were secured from books and periodicals.

Findings and Conclusions: The laboratory of industries, or general shop, fits the individual interests and needs found on the elementary level better than any other type of industrial arts program.

3224. **WIEVEL, BERNARD F. (M. S.).** *Preparation and Duties of Iowa Industrial Arts Teachers.* Iowa State College, 1943. 85 p.

An investigation to gather related data on factors pertaining to Iowa industrial arts teachers, their qualifications and duties, and to make deductions and draw conclusions from the data.

3225. **WIGEN, RAY A. (M. A.).** *Related Information in Mechanical Drawing.* University of Minnesota, 1933. 77 p.

An analysis of the problems in teaching related information to mechanical drawing classes in Minnesota, based on course materials, textbooks, and questionnaires to twenty-seven teachers. A list of fifty motivating devices used in such teaching is included.

3226. WIKOFF, CHARLES H. (Masters). ***Developing and Judging the School-Shop Exhibit.*** **Ohio State University, 1930.**

3227. WILSON, MAURICE C. (Masters). ***The Teaching of Mechanical Drafting in the High Schools of North Carolina and Tennessee with Recommendations.*** **University of Tennessee, 1930.**

3228. WINDSOR, BILLY DAN. ***Industrial Arts In A Transitory Student Area.*** **M. A., 1954, Kansas State Teachers College. 31 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To analyze the problem of teaching industrial arts in fluid, mobile, or migratory communities.

Source of Data: Data were obtained from interviews, school records, and literature.

Findings and Conclusions: The problems involved in such teaching are irregular school attendance, lack of scholastic interest, delinquency, lack of feeling of accomplishment, poor citizenship and school loyalty, and insecurity. Type of shop and programs to best cope with these problems are suggested and discussed.

3229. WININGER, WILLIAM HENRY. ***Industrial Arts As a High-School Elective Subject.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1942. 33 p.**

A study of the interests of 1,009 boys in industrial arts.

3230. WINTER, WESLEY P. ***Correlating the Teaching of Manufacturing Processes With the Teaching of Properties of Materials in Engineering Education.*** **M. Ed., 1952, The Pennsylvania State University, University Park.**

Purpose: To present the purposes, methods, problems and extent of present efforts in correlating the teaching of manufacturing processes with the teaching of properties of materials in engineering education.

Source of Data: Data were secured by a documentary-analysis and interview method to establish a starting point and a normative-survey using a questionnaire to correlate the teaching of two fundamental subject matter areas.

Findings and Conclusions: Real purposes, methods, and problems exist when the teaching of two fundamental subject-matter areas are correlated. An extensive number of engineering schools are correlating the teaching of manufacturing processes with the teaching of properties of materials. Most of the schools accomplish this by discussing important material from the related area in the basic course work. A very few schools correlate by integration. A noteworthy number of educators claimed that closer correlation approaching integration is desirable and attainable.

3231. WOODRUFF, SAMUEL M. (M. S.). ***A Time Study of the Shop Instructor's Day.*** **Purdue University, 1935. 33 p.**

A study, based on questionnaires sent to sixty-four instructors of industrial arts, to determine the proportion of the instructor's time spent on such activities as instruction, clerical work, and disciplinary measures.

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3232. WRIGHT, LAWRENCE SYDNEY. ***Relation of Units Taken and Marks Earned in High School Subjects to Navy School Achievement.*** **Ed. D., 1954, University of Missouri. 164 p. Library, University of Missouri, Columbia.**

Purpose: To ascertain the relation of units taken and marks earned in high school science, mathematics and industrial arts and subsequent achievement of men in the Electrician's Mates School, the Electronics Technicians School and the Machinist's Mates School, at Great Lakes, Illinois.

Source of Data: Information regarding the number of units taken and marks earned in selected high school subjects by 726 navy men was obtained through an information form submitted to the principal of the last high school reportedly attended by these men. These data were then compared with the final grade earned in the navy school as reported on official graduation lists.

Findings and Conclusions: The number of units taken in high school science and industrial arts bears little, if any, relation to achievement in any of the three navy schools. However, marks earned in these high school subjects have a direct and significant relation to achievement in each of the three navy schools. While in isolated cases the number of units taken in high school subjects may be related to achievement in navy schools, in general, a more consistent relationship exists between marks earned in high school subjects and navy school achievement. The combined marks earned in high school science, mathematics, and industrial arts are more closely related to achievement in the navy schools than are the marks earned in anyone of these subjects alone. The size of the coefficients of correlation obtained would indicate that factors other than those measured were operating as contributors to navy school achievement.

3233. YARRINGTON, ROBERT GRANT, (M. A.). *The Psychology of Mechanical Drawing.* Southwest Texas State Teachers College, 1940. 34 p.

A discussion of intelligence as related to drawing ability and the teaching of drawing. Some psychological considerations and their relation to the teaching of mechanical drawing are presented.

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3234. YOUMANS, CHARLES VINCENT. *The Role of the Public Secondary School in the General and Occupational Preparation of Youth Entering Skilled and Semiskilled Jobs in the Manufacturing Industries.* Ed. D., 1955, University of Kentucky. 256 p. Graduate School, University of Kentucky, Lexington.*

Purpose: To ascertain the services the public secondary school should provide for the general and occupational preparation of youth entering industry on the skilled and semiskilled levels.

Source of Data: Data were obtained from a questionnaire sent to juries composed of industrial training directors, teachers of industrial education, general educators, and education and research directors of the American Federation of Labor and the Congress of Industrial Organizations.

Findings and Conclusions: Most respondents believe that youth entering skilled occupations should have pre-employment training keyed to "job families". Youth entering semiskilled occupations should have instruction in job skills and technical information that are of general use in industry. Both general education and industrial education are essential in preparing youth for industrial type jobs. As a means of preparing youth in the skilled occupations, the day-trade school was ranked first, the cooperative plan second, and "improved apprenticeship" third. As a means of training youth in semiskilled jobs, all groups, except the training directors, ranked cooperative education first, industrial arts second, and the day-trade school third. Respondents designated the public secondary school as the best agency for coordinating the over-all training of youth for skilled and semiskilled jobs in industry.

Analysis of Textbooks and Materials, Professional and Scientific Terms and Vocabulary

3235. ALLEN, CLIFFORD M. *A Glossary of Terms in Industrial Education.* M. Ed., 1949, Agricultural and Mechanical College of Texas. 75 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, College Station.

Purpose: To complete a glossary or dictionary devoted exclusively to terms used in industrial education.

Source of Data: Criteria were established for screening words, writings, and speeches. Suggestions of students and teachers were studied for terms to be used in the glossary and the terms selected were approved by experts in industrial education.

Findings and Conclusions: A glossary of several hundred terms used in industrial education was compiled. The definitions used were approved by authorities in industrial education.

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3236. ANDERSON, HERBERT ADOLPH. *Analysis of Content of Woodworking Textbooks Based on Research Findings of the Forest Products Laboratory.* Ed. D., 1953, University of Missouri. 198 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the extent to which technical information, considered essential by the Forest Products Laboratory personnel for an intelligent understanding in the construction of shop projects, furniture and small frame buildings, has been included in woodworking texts, to ascertain how complete the information has been reported, and to ascertain whether the information in these textbooks is in agreement with the findings of the laboratory.

Source of Data: Data were obtained from the library of the Laboratory, 621 publications were selected for the study. An analysis was made of the technical information topics included in the publication. These topics were appraised by Laboratory personnel. Finally, the technical information topics appraised essential were checked against ten woodworking textbooks for inclusion, agreement in fact, and completeness.

Findings and Conclusions: Woodworking textbooks include information on less than one-half of the information topics considered essential by those who have carried out the research, and even then, the items included have scant coverage. Information contained in the textbooks is in almost complete agreement with the findings of scientific research. Information on the findings of wood research is scattered throughout hundreds of small publications which are not readily accessible to the user of wood products. Most woodworking textbooks are written for some specific grade level of students, for a certain area of information, or for students in some specific occupation, therefore, they are suitable as general reference books for woodworking. Authors, publishers, curriculum planners, and teachers might well use the list of woodworking technical information items appraised essential by the Forest Products Laboratory personnel and the publications, as an index to writing and revising books, and to preparing content of courses.

3237. ANDERSON, JOHN R. ***Contributions to Industrial Education Part III.*** **M. A., 1950, University of Minnesota. 55 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To prepare an index and summarization of each of 35 Plan B Papers (91 through 125) submitted by candidates for the M. A. degree, under plans without theses, in the Department of Industrial Education.

Source of Data: Problem and characterization of method and content.

Findings and Conclusions: None reported.

3238. BARRON, JAMES E. (M. S.). ***An Analysis of Mechanical Drawing Books Frequently Used in Senior High Schools.*** **Iowa State College, 1936. 49 p.**

An analysis of mechanical drawing books written for senior high schools. Suggestions are incorporated for use of new units in such books as follows: air-conditioning, electrical appliances, block-printing, commercial art, etching, and cartooning.

3239. BERES, LOUIS BALLANTINE (M. A.). ***A Study of Forty-Two Woodworking Textbooks Published Between 1892–1938.*** **George Washington University, 1942. 44 p.**

An analytical consideration of woodworking textbooks published between 1892 and 1938 which indicates the variety of opinion regarding the material content and the relative importance of the areas of study. The materials emphasized are classified according to their predominance.

3240. BLOCK, FRANK D. ***An Evaluation of Woodworking Textbooks.*** **M. Ed., 1955, Wayne University. 38 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To evaluate woodworking textbooks.

Source of Data: Data were obtained from evaluation forms used to rate the books under consideration.

Findings and Conclusions: Numerous textbooks are suitable for industrial arts classes, and it is the responsibility of the teacher and administrator to select the book which best meets the need of their situations.

3241. BOLLINGER, ELROY W. (M. A.). ***A Contemporary Study of Professional Terms in Industrial Arts and Vocational Education.*** **Ohio State University, 1931. 141 p.**

A study of professional terms used in industrial arts and vocational education, with an attempt to establish criteria for evaluating and formulating definitions. It points up the confusion existing and the need for establishing proper usage.

3242. BRANDT, LEO (M. S.). ***A Reading Vocabulary For High School Pupils in Woodworking Classes.*** **Iowa State College, 1936. 86 p.**

An investigation of the frequency with which words occur in a running word list of 101,275 words in an effort to determine, in a scientific manner, the essential minimum vocabulary used in woodworking classes.

3243. BRIDGES, PAUL W. ***A Proposed List of Books for an Industrial Arts Library with Suggested Criteria for Evaluation.*** **M. S. in Ind. Ed., 1950, Kansas State Teachers College. 218 p. Porter Library, Kansas State Teachers College, Pittsburg.**

Purpose: To make available a large list of classified books which will be useful to those interested in the various phases of industrial arts.

Source of Data: The methods of selection and classification used by 4 of the leading industrial arts schools and the H. W. Wilson, Publishers, were employed in this study.

Findings and Conclusions: The selection covers the years between 1935 and 1949, inclusive, and encompasses approximately 5,000 books by over 600 publishers. Book selections criteria are included in the report.

3244. CARTIER, WARREN LELAND. *Analysis of the Methods of Textbook Selection for Industrial Arts Courses in Use Throughout the Forty-Eight States.* M. Ed., 1953, North Carolina State College. 16 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the methods used in selecting textbooks in industrial arts for the State adopted list and to propose a "best method".

Source of Data: Data were obtained from questionnaires sent to each of the forty-eight states.

Findings and Conclusions: The textbook committee should be made up of representative industrial arts teachers, school administrators and state department officials. The committee should select several books in one area or subject and the teacher should have the opportunity to select one.

3245. CLARKE, EDMUND V. (M. S.). *A Reading Vocabulary for Students of Forge Practice Based on an Analysis of Textbooks in Forging.* Iowa State College, 1935. 134 p.

A study of textbooks on forge practice to formulate a vocabulary of 4,840 words, nineteen abbreviations, and eight signs for forge classes.

3246. COLTHARP, RAYMOND JOHN. *Textbooks in Industrial Arts Education.* M. S. in Ind. Ed., Kansas State Teachers College, 1939. 77 p.

Evaluative criteria and standards in score card form by which industrial arts textbooks may be judged.

3247. FOX, MARIUS A. (M. A.). *An Analysis of the Trade Student's Comprehension of the Vocabulary of His Trade Literature.* University of Pittsburgh, 1936.

An investigation of the status of vocabulary comprehension and its relation to the trade experience level of the student, the type of words encountered in the trade literature, and their relative importance. The study considers the need for systematic testing and instruction to overcome weaknesses in comprehension of terms.

3248. HAROLDSON, HAROLD O. *Leading Sociologists and Industrial Education.* M. A., University of Minnesota, 1944. 62 p.

An analysis of selected textbooks by selected authors in the field of sociology, with reference to their treatment of industrial arts and trade education.

3249. HUTCHINSON, HERBERT H. (Masters). *An Etymological Study of Certain Professional and Scientific Terms in the Vocabulary of Industrial Arts and Vocational Education.* Ohio State University, 1930.

3250. INGE, HELENE GRACE (M. A.). *Some Opinions Concerning the Relationship of Fine and Industrial Arts.* George Peabody College, 1936. 112 p.

A study of the opinions of authors of industrial arts books as to why and how industrial arts should be taught. Fifty-eight books which were published between the years 1914–1936 were used.

3251. JONES, WILLIAM E. (Masters). *A Study of the Vocabulary Load and Minimum Vocabulary in Texts for Mechanical Drawing for High Schools.* Ohio State University, 1931.

3252. KEENY, ALAN P. Jr. *Readability of Four Industrial Arts Woodworking Textbooks.* M. Ed., 1953, University of Maryland. 16 p. Industrial Education Department, University of Maryland, College Park.

Purpose: To ascertain the reading level of four woodworking textbooks commonly recommended for use at the junior high school level and to determine the range of reading levels represented in these books.

Source of Data: Four books recommended most frequently by courses of study from various states were selected for inspection. The Dale and Chall formula for predicting readability was used.

Findings and Conclusions: The four tests were found to have an average reading level of grades nine and ten, but each book included a wide range of levels of readability. Some of this spread appeared to be due to the authors' use of unduly long sentences and in their use of words not commonly known to the age level of students who use the books. Part of the difficulty may result from the effort of an author to write one book for a wide range of potential purchasers. All of the books examined require systematic instruction on the part of the teacher if they are to be used effectively by junior high school students.

3253. KING, CARL H. (M. S.). *A Reading Vocabulary for Students of Machine Shop Practice.* Iowa State College, 1937. 102 p.

A study to determine a list of words commonly used in machine shop books which are used as text or reference material in machine shop classes. The investigation covered 112,509 words.

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3254. KOHLER, RICHARD CHARLES. *Arts Activities Integrated With The Teaching Of Reading, Science, And Arithmetic In The Elementary School.* Ed. D., 1951, University of Missouri. 222 p. Library, University of Missouri, Columbia.

Purpose: To ascertain and analyze the arts activities textbook writers recommend using on an integrated basis in the teaching of reading, science, and arithmetic at the various grade levels of the elementary school, and to present and interpret findings in a way helpful to persons interested in the preparation and advancement of elementary teachers.

Source of Data: Data were secured from an analysis of ten series of teacher's guidebooks, literature on present day practices and procedures followed in elementary schools, and literature on the use of the arts in the elementary schools.

Findings and Conclusions: Teacher's guidebooks in reading, science, and arithmetic recommended thirty-seven different types of arts activities for integration with the teaching of these subjects in the elementary school. Thirty-four types of arts activities appeared in the teacher's reading guidebooks; twenty-five types appeared in the teachers' science guidebooks; and fourteen types appeared in the teacher's arithmetic guidebooks. The distribution of two- and three-dimensional arts activities remained relatively constant through the grades for all areas of the curriculum analyzed. The frequency of appearance of the arts activities decreased as the grades in school progressed. Many types of arts activities are common to and can be integrated with the teaching in each grade of the elementary school. Many types of arts activities are and can be integrated with more than one area of the curriculum.

3255. KYL, RICHARD A. (M. S.). *Analysis of Sheet Metal Publications to Determine a Reading Vocabulary for Students in Sheet Metal Classes.* Iowa State College, 1935. 98 p.

An investigation of publications dealing with sheet metal to determine the minimum essential vocabulary to be used in sheet metal classes.

3256. LANE, IRVING EUGENE (M. S.). *A study of Text and Reference Material Used for Industrial Arts Metal Working, in the Secondary Schools of California.* Oregon State College, 1942. 127 p.

A study which considers the extent to which books are used for industrial arts metalworking, how they are used, and their influence on pupil marks and related problems.

3257. LANGENDERFER, FINTON A. (M. S.). *The Selection of Text Books for Woodfinishing, Painting, and Decorating Based Upon Recommended Instructional Units (Books Classified According to Levels of Instruction).* The Stout Institute, 1940. 33 p.

A statistical study of thirty-three textbooks and tweleve state courses of study for the purpose of determining instructional units in general finishing. It includes source material for teaching these units.

3258. MARTIN, BERYL EDISON. *The Application of Accepted Criteria In the Analysis of Available Theses on Auto Mechanics.* M. S., Iowa State College, 1933. 87 p.

An analysis of theses on auto mechanics.

3259. MATSON, WILLIAM A. *Industrial Arts Professional Terms.* M. A., 1950, University of Minnesota. 40 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To define terms in the professional phases of industrial arts, based upon our special literature and summarized in form.

Source of Data: Extracted definitions from industrial arts professional textbooks by various authors were compared and condensed.

Findings and Conclusions: One hundred and one industrial arts terms and expressions were studied and each was summarized into a comprehensive definition.

3260. **MAYS, WILLIAM A.** *Evaluation of Selected Industrial Bulletins and Other Technical Materials Related to Industrial Arts.* M. S., 1950, Oregon State College. 61 p. Library, Oregon State College, Corvallis.

Purpose: To evaluate 100 booklets and pamphlets, and 25 charts, published by industrial firms for use by industrial arts teachers.

Source of Data: Comparative and analytical research.

Findings and Conclusions: The booklets and pamphlets, and charts evaluated in the study are a valuable source of related technical information for industrial arts classes.

3261. **McCULLOUGH, ARTHUR E. (M. S.).** *A Reading Vocabulary For Cement And Concrete Based on an Analysis of Current Literature.* Iowa State College, 1937. 77 p.

A study to determine a minimum essential vocabulary for the purpose of aiding the standardization of the terminology of concrete literature.

3262. **McGHEE, JOHN S.** *An Analysis of Industrial Arts Records with Reference to School Shop Forms in Secondary Schools.* M. A., 1950, Ohio State University. 118 p. Education Library, Ohio State University, Columbus.

Purpose: To find the facts relating to records and record forms that are used in industrial arts education and to evaluate these forms in terms of establishing criteria.

Source of Data: Examination of books and magazines, information received from industrial arts leaders, interviews with teachers and analysis of forms used in shops throughout the country.

Findings and Conclusions: Adequate records should be kept in industrial arts program. Records and forms enable the work to proceed intelligently and harmoniously and minimizes the labor of teaching. Records should be used in accordance with definitely known purposes and possess certain desirable characteristics.

3263. **MILLER, O. C.** *Analysis of Industrial Drawing Books Published Since 1940.* M. S., 1951, Oklahoma Agricultural and Mechanical College, 49 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To analyze mechanical drawing books published since 1940.

Source of Data: Data were obtained from a general rating of all books involved plus a page analysis of the ten books rated the highest.

Findings and Conclusions: Most of the drawing books rated above average on a criterion basis. The number of books related to aircraft drawing and sketching has increased in recent years.

3264. **NAY, WILBUR S. (M. S.).** *An Analysis of Carpentry Books Used in Schools for Determining a Reading Vocabulary in Carpentry.* Iowa State College, 1936. 102 p.

A survey to determine a list of words commonly used in carpentry books which are employed as text or reference material in junior and senior high school woodworking and carpentry classes. The study covered 112,092 running words.

3265. **PASCOE, LOIE A., *Jr.*** *A Proposed Plan for Selection of Textbooks and Reference Books for the Industrial Arts Library.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 162 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To point out that a collection of source materials in every field of endeavor should be available in the school shops, and to present an annotated bibliography of books in the 15 most frequently offered courses.

Source of Data: Survey of publisher's catalogs and bibliographies, personal conferences with experienced teachers in each area of study.

Findings and Conclusions: Presents a "Bibliography for Industrial Arts Library" containing 262 entries selected for professional reading in 15 subject matter fields. Chief problems in establishing a classroom library are administering, amount of money per pupil, and the physical needs of the library.

3266. **RASMUSSEN, HAROLD (M. S.).** *The Selection of Textbooks in Gen-*

eral Drawing for Intermediate Schools—A Study Based Upon Recommended Instructional Units. The Stout Institute, 1940. 24 p.

By means of a study of eleven state and eight city courses of study, the writer developed a chart of recommended instructional units for the purpose of using it as an evaluation basis for textbooks.

3267. **REMDE, A. O.** (M. S.). *Selection of Text Material for Senior High School Drawing—A Documentary Survey of Selected Text Materials Published in the United States Between the Years 1915 to1940 to Determine a List of Instructional Units Upon Which to Base the Selection of Text Material.* The Stout Institute, 1941. 59 p.

By means of a survey of twenty-three publishers, the writer indicates the educational content of twenty-four books by listing the contents according to instructional units. The opinions of teachers and the textbook authors concerning subjects which should be taught in this field are compared.

3268. **RUTHRAUFF, CURTIS LLOYD** (M. S.). *A Reading Vocabulary for Mechanical Magazines Used in Industrial Arts Classes.* Iowa State College, 1937. 109 p.

A study to standardize general shop terminology and to determine the minimum essential vocabulary for use in general shop classes. A list of six hundred words is included.

3269. 1865 **SCHRODER, HARRIET** (Masters). *A Survey of Vocational Books for Senior High School.* University of Southern California, 1941.

3270. **SCHULTZ, OTTO C.** *Contributions to Industrial Education—Part II.* M. A., 1949, University of Minnesota. 56 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare an index and summarization of each of 35 Plan B papers (56 through 90) submitted by candidates for the M. A. Degree, under plans without theses, in the Department of Industrial Education.

Source of Data: Problem and characterization of method and content.

Findings and Conclusions: None reported.

3271. **SHAW, LYLE J.** (M. S.). *Rating Two Automobile Laboratory Textbooks on Vocabulary Load and Sentence Structure.* Iowa State College, 1940. 85 p.

A study to rate the vocabulary load and sentence structure of two automobile laboratory textbooks. The two books used in making this rating were "The Gasoline Automobile" and "Automotive Service."

3272. **SHIMMICK, JOHN JOSEPH.** *A Comparative Analytical Study of Woodwork Textbooks in Industrial Arts Published From 1912 Through 1936.* M. A., University of Minnesota, 1937. 97 p.

A comparative study of the content and suggested methods in industrial arts woodworking textbooks at the junior high school level from 1912 through 1936.

3273. **SMITH, PAUL W.** (M. A.). *Pre-Induction and Other Industrial Arts Texts.* University of Minnesota, 1944. 145 p.

A description of the general mechanical make-up of thirteen pre-induction texts and thirteen industrial arts texts of a similar content and period of publication. Comparison is made on book size, construction, grade of paper, binding, illustrations, parts or divisions, content, and presentation.

3274. **STERLING, WILLIAM H.** (M. S.). *An Analysis of Woodfinishing Books Used in Schools For Determining a Reading Vocabulary in Woodfinishing.* Iowa State College, 1937. 108 p.

A survey to determine a list of words commonly found in woodfinishing books which are used as textbooks or reference material in junior and senior high school woodfinishing courses. The investigation covered a total of 158,669 running words.

3275. **SUTTON, FRANCIS A.** (M. S.). *A Reading Vocabulary for Industrial Arts Classes Based on an Analysis of Farm Shop Publications.* Iowa State College, 1936. 120 p.

A survey to determine a list of words commonly found in farm shop books used as text and reference material in high school farm shop classes. A running list of 105,627 words was used.

3276. VOTH, JOHN J. (M. S.). *An Analysis of Mechanical Drawing Textbooks Used in Iowa High Schools for the Purpose of Determining a Reading Vocabulary For Mechanical Drawing.* Iowa State College, 1933. 92 p.

A study of words covering the subjects of general mechanical drawing, architectural drawing, lettering, and blueprint reading as they are taught in the junior and senior high schools in Iowa.

3277. WESTERDALE, LEONARD WALLACE. *A Determination of the Vocabulary Burden of Three Mechanical Drawing Textbooks.* M. A., University of Michigan, 1941. 141 p.

An analysis of the relative difficulty of words in drafting textbooks in terms of their use by eighth- and ninth-grade pupils.

3278. WHEELER, JAMES P. *A Review and Evaluation of Eighteen Popular Mechanics Handbook.* M. S., 1952, Oklahoma Agricultural and Mechanical College. 60 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To review and evaluate eighteen Popular Mechanics Handbooks as they contribute to the industrial arts teaching field.

Source of Data: Data were obtained from an analysis of the content of eighteen issues of the Popular Mechanics Handbook.

Findings and Conclusions: All of the handbooks contain information useful in the industrial arts program.

3279. WILLIAMS, AMOS GRANT (M.S.). *An Analysis of Textbooks in Photography to Determine a Reading Vocabulary for Students of General Photography.* Iowa State College, 1936. 76 p.

3280. WINTER, MAX A. (M.S.). *Common Errors in Mechanical Drawing Technique.* Iowa State College, 1931. 40 p.

An analysis of standard drafting texts to determine correct techniques. Junior and senior high school drawing classes were observed and 1,057 errors in technique were noted. A graphical summary of these errors is presented.

3281. WORTHINGTON, ROBERT M. *Index of Ten Homecraft Periodicals.* M. A., 1949, University of Minnesota. 56 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To the attention of industrial arts instructors, as a source of new projects and of consumer education concepts.

Source of Data: A canvass of 10 of the most widely circulated homecraft journals for the year 1948. Articles were classified under 19 subjects matter fields or major industrial arts areas.

Findings and Conclusions: None reported.

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3282. YOUNG, TALMAGE BRIAN. *An Analysis of Textbook Emphasis in Industrial Arts Education.* Ed. D., 1953, University of Florida. 260 p. Library, University of Florida, Gainesville.

Purpose: To ascertain the status of the industrial arts textbook and its availability to the public schools.

Source of Data: Data were taken from the 152 textbooks submitted by publishers, the U. S. Office of Publication, various periodicals and publications, and correspondence with publishers.

Findings and Conclusions: The lack of adequate criteria for textbook content, classification, and selection presents a serious problem. To achieve an adequate coverage of all objectives, it is necessary to use two or more books in many of the subject areas. At present, the comprehensive textbook is non-existant in many of the subject areas. In order to provide for continued growth of industrial arts, the production of textbooks should be based upon need. The quality of textbooks should be improved through adequate research. Textbooks used in industrial arts classes are often written for other purposes. The production of textbooks for industrial arts use is controlled by too few individuals.

Bibliographies

3283. BIGGAM, WILLIAM R. ***Periodical Literature on Industrial Education.*** **M. A., University of Minnesota, 1948. 171 p.**

A classified and annotated guide to professional periodical literature in industrial education, from 1943 to 1948.

3284. CLAUSON, JOHN N. ***Abstracts of Masters' Theses in Industrial Education.*** **M. A., University of Minnesota, 1948. 127 p.**

A descriptive analysis of Plan A masters' theses in industrial education at the University of Minnesota.

3285. CUCKOVICH, JOHN. ***An Annotated Bibliography and Evaluation of Publications of Shop Mathematics.*** **M. Ed., 1949, Wayne University. 52 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To investigate and evaluate current shop mathematics textbooks.

Source of Data: Data were obtained by interviews with teachers of shop mathematics and available textbooks.

Findings and Conclusions: Few shop mathematics textbooks cover all phases of mathematics for the industrial field. They assume too great a knowledge of the various trades and too many formulas are presented without attempt at derivation or rationalization. Prospective textbook authors should construct books only after they surveyed the skilled trades and industrial occupations for the mathematical needs of the user.

3286. DAHLMAN, MARVIN SHELDON. ***United States Government Materials Useful in Industrial Arts: An Annotated Bibliography.*** **M. A., 1952, University of Minnesota. 46 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To make United States government publications more accessible to industrial arts teachers and students.

Source of Data: Data were secured by a survey made of Government publication price lists, selected lists, and monthly catalogs for publications of an industrial arts nature.

Findings and Conclusions: None.

3287. DAVENPORT, LEE W. ***A Summation of Articles Pertaining to the General Shop Published in the Industrial Arts and Vocational Education Magazine.*** **M. S., 1951, Oklahoma Agricultural and Mechanical College. 71 p. Graduate Office, Oklahoma Agricultural and Mechanical College, Stillwater.**

Purpose: To summarize all articles pertaining to any phase of the general shop as reported in the Industrial Arts and Vocational Education magazine, from 1923 to 1951.

Source of Data: Data were obtained from various issues of the Industrial Arts and Vocational Education magazine.

Findings and Conclusions: The general shop is being accepted by progressive educational leaders, especially those interested in industrial arts. Because of the flexibility and the varied qualities of the general shop, it is believed that this program is best suited to the junior high school level.

3288. DESGUIN, PAUL E. ***A Brief Study of a Modern Industrial Culture in Relation to the Teaching of Industrial Arts.*** **M. A., 1949, Ohio State University. 80 p. Education Library, Ohio State University, Columbus.**

Purpose: To study the modern industrial culture from the viewpoint of structure and operation of culture patterns in their effects upon the development of the individual.

Source of Data: Bibliographical research, in which some of the findings of cultural anthropology, social anthropology, sociology and other social sciences were examined from the viewpoint of the educator.

Findings and Conclusions: One of the main purposes of a program of industrial arts should be to bring the individual to a deep appreciation of the interdependent and social nature of self-hood through societal living in the school. A study of industry should emphasize human relationships in order to bring material values and spiritual values into a proper perspective, and in order that vocational guidance may be tempered by the cultural facts of life—that many individuals will be obliged to seek satisfactions in life within a framework of limited economic opportunity.

3289. FENELON, MARY FLORIAN. ***The Construction of a Model Catalog of the Free and Inexpensive***

Teaching Materials in the St. Louis University Curriculum Laboratory. M. Ed., St. Louis University, 1946. 109 p.

An essay for setting up a model catalog of free and inexpensive materials in a curriculum laboratory. These materials all secured through producers and industries.

3290. FREDERICK, LAWRENCE MONT (M. S.). *Content of Articles Published in Industrial Arts and Vocational Education Magazine 1936–1947.* Iowa State College, 1948.

A study to determine the type of subject matter published in the "Industrial Arts and Vocational Education" magazine. Seventy-eight large categories based on subject areas and professional education topics are summarized.

3291. FULLER, CHARLES D. *A Survey of the Educational Material Made Available by a Selected Group of the Industries of Indiana.* M. S., 1951, Purdue University. 27 p. Industrial Education Office, Purdue University, Lafayette, Ind.

Purpose: To ascertain the extent and type of materials made available to the schools by industries, and the adaptability of these materials to school situations.

Source of Data: Data were secured by means of questionnaires received from 61 industrial companies in the State of Indiana.

Findings and Conclusions: Industries provide a great deal of instructional material for schools. The materials are in the form of booklets, colorful charts, drawings, diagrams, and other similar instructional aids. The schools generally are not taking advantage of these materials, most of which are free.

3292. GARBER, J. F. (M. Ed.). *A Selected Bibliography (Annotated) for Teaching of Industrial Arts. 1930–41.* Pennsylvania State College, 1941. 112 p.

A bibliography of pertinent available literature relating to industrial arts education. The author, title, publisher, date of publication, number of pages, and a brief summarizing statement are given. An author index and a directory of publishers are included.

3293. GOULET, ERNEST F. *Purposes of Industrial Subjects.* M. A., University of Minnesota, 1945. 126 p.

A documentary study (periodical references, 1920 through 1944) of objectives listed for each of the common industrial arts subjects at the secondary level.

3294. GRAY, ROLLAND O. (M. S.). *The Literature of Industrial Arts Education as Determined by a Survey of the Libraries of Seven Teacher Training Institutions of the Middle West.* Iowa State College, 1934. 173 p.

A survey providing a bibliography of industrial arts books found in seven teacher training institutions in the middle west.

3295. GREENE, JOHN C. *Selected Annotated Bibliography of Electrical References for Vocational and Technical High Schools.* M. Ed., 1953, Wayne University. 43 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To select and annotate a list of books on electricity suitable for classes in vocational and technical high schools.

Source of Data: Data were secured from books, magazines, and essays.

Findings and Conclusions: From a careful examination of over a hundred books on electrical subjects, seventy-seven were found to be satisfactory for compilation in this bibliography.

3296. GROFF, ALDEN D. *A Metal Projects Index.* M. A., 1950, University of Minnesota. 39 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To provide a useful, up-to-date index of plans for projects in the field of metalwork.

Source and Data: Data were obtained from a canvass of more than 70 books and bulletins and of writings in 7 periodicals published over a 10-year period.

Findings and Conclusions: An up-to-date index of plans for projects in metalwork was developed.

3297. GUNDERSON, B. HARRY (M. S.) *An Annotated and Evaluated List of Industrial Teaching Aids for Metal-Working Classes.* Indiana University, 1940. 120 p.

This study, made in 1939–40, selects and organizes teaching aids material into usable form. The study lists only such teaching aids as can be readily secured from industry by an instructor in school shop metal-working classes, by instructors of related subjects, and by administrators and supervisors of industrial education.

3298. HOFACKER, FLOYD R. *A Critical Machine Shop Bibliography.* M. S., 1949, Bowling Green State University. 116 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To establish a method of evaluating machine shop books and to list those books that would be helpful in teaching machine shop to high school students.

Source of Data: A philosophy of education was stated to serve as a foundation of developing objectives. Objectives of machine shop were listed to conform to the accepted general objectives of education and industrial arts. Objectives were analysed as desired behavior changes. A list of desirable learning units was compiled which seemed to lead the student toward the objectives. A study of the past and the present methods of book selection and evaluation was made. A method of evaluating machine shop books was proposed.

Findings and Conclusions: Textbooks should be critically evaluated before they are made available for student use. The content of the book largely determines its usefulness. A school shop should have several books available for student use. Some books contain information that other books do not have. Machine shop books can be improved by the addition of references, summaries and review questions. Books should emphasize shop safety. Five books were recommended for high school use.

3299. INGRUM, EMMETT W. (M. S.). *An Analysis of Professional Literature on Current Trends in Vocational Education.* University of Southern California, 1938. 108 p.

A study of professional literature on vocational education emphasizing its place in the total educational picture and its close relationship to social and economic conditions.

3300. JOACHIM, FRED N. (Masters). *Survey of Current Literature on Vocational Education.* Oklahoma A. & M. College, 1932. 125 p.

3301. JOHNSON, CLIFFORD S. *Index to Woodworking Projects.* M. A., University of Minnesota, 1947. 31 p.

An index of selected woodworking projects with specific citation of sources.

3302. JONES, LEONARD (M. A.) *Matching Abilities and Jobs.* University of Colorado, 1940. 163 p.

A survey of avilable literature on matching abilities of individuals and jobs. Techniques of employment are presented and evaluated in terms of matching jobs with individuals.

3303. KUEFLER, HUBERT. *Reader's Guide in Industrial Education.* M. A., University of Minnesota, 1945. 56 p.

A study of basic books in the philosophy and practice of industrial education; topics treated, special emphasis, and meagerness of presentation.

3304. LONG, DALE C. (M. S.). *An Annotated Bibliography of Vocational Education and Industrial Arts.* Pennsylvania State College, 1938. 202 p.

An analysis of six hundred publications dealing with all phases of vocational education and industrial arts. It includes for each publication the title, publisher, author, date of publication, number of pages, and a brief summarizing statement.

3305. MITCHELL, JOHN. *Physical Aspects of the Industrial Arts Shops.* M. A., University of Minnesota, 1947. 131 p.

A canvass of the literature of idustrial education, architecture, and educational administration, 1930 to 1947, as to physical aspects of industrial arts shops.

3306. MYERS, PHIL L. *A Bibliography of teacher Training Material Appearing in Industrial Arts and Vocational Education Magazines From January 1935 Through June 1949.* M. S., 1949, Oklahoma Agricultural and Mechanical College. 50 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To compile a list of magazine articles, pertinent to teacher training, which may be found in the Industrial Arts and Vocational Education Magazine from January 1935 through June, 1949.

Source of Data: Research and review of 152 issues of the Industrial Arts and Vocational Educational Magazine.

Findings and Conclusions: No findings or interpretations reported.

3307. **NICHOLAS, ROBERT ASHLEY.** *Preparation of a Bibliography of Teaching Aids and Devices.* M. Ed., 1955, Wayne University. 39 p. Library, Wayne University, Detroit, Mich.

Purpose: To develop a bibliography of teaching aids and devices.

Source of Data: Data were obtained from profesisonal books and magazines, card catalogs, the Readers Guide to Periodical Literature, and Industrial Arts Index.

Findings and Conclusions: Numerous articles relating to teaching aids are available in magazines such as the Industrial Arts and Vocational Education magazine, the School Shop magazine, theses and essays and other publications. There is an increasing recognition of need for courses concerned primarily with teaching aids and devices.

3308. **NUZUM, JOHN D.** *An Annotated Bibliography of Tests.* M. A., University of Minnesota, 1948. 59 p.

A comprehensive listing of teacher-made tests as published in the *Industrial Arts and Vocational Education* magazine from January 1937 to June 1948.

3309. **ORCUTT, ROBERT NEWTON** (M. S. in Ed.). *Training for Industrial Supervision and Foremanship—An Annotated Bibliography.* Cornell University, 1948. 114 p.

An annotated bibliography of 325 books, magazines, pamphlets, and monographs, written since 1935, regarding supervisory training. The trends and implications of supervisory training and some techniques in organizing such programs are considered.

3310. **PAYNE, IRVIN L.** (M. S.). *The Literature of the Diversified Occupational Program: A Classified, Annotated Bibliography.* Pennsylvania State College, 1942. 137 p.

An analysis of literature pertinent to related instruction for diversified occupational programs. The literature was selected on the basis of a questionnaire sent to co-ordinators in Virginia. Forty-six units are included in the study.

3311. **POWELL, PAUL E.** (M. S.). *An Analysis and Annotation of the Investigations Completed at the Stout Institute From 1938 to 1946.* The Stout Institute, 1946. 100 p.

An analytical description of the six semester hour credit investigations which have been completed at The Stout Institute between 1938 and 1946. The study includes a method of research analysis and a method of presenting and annotating graduate investigations.

3312. **POWERS, LAWRENCE.** *A Survey of Reference Material in the Field of Trade and Industrial Education.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 42 p. School of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To develop a useful index of reference books, periodicals, and other publications to assist instructors and students of trade and industrial education in selecting supplementary reading and useful study material.

Source of Data: Examination of the issues of the American Vocational Journal published since January, 1940, and 145 other magazines.

Findings and Conclusions: The report contains 247 reference books pertaining to vocational education, together with their library call numbers. Twenty-five publications issued by the U. S. Office of Education are listed. Thirty-three periodical publications have been found to contain articles pertaining to vocational education.

3313. **ROONEY, ROLAND W.** *Contributions to Industrial Education—Part IV.* M. A., 1950, University of Minnesota. 43 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To prepare an index and summarization of 23 plan B Papers submitted by candidates for the M. A. degree, in the Department of Industrial Education.

Source of Data: Data were obtained from files of University of Minnesota.

Findings and Conclusions: The report gives names, titles and annotations of 23 non-theses reports.

3314. **SIDERS, CECIL F.** (M. A.). *An Annotated Bibliography on Woodworking Literature Appearing During the Years 1914 to 1933 Inclusive.* Ohio State University, 1934. 252 p.

An examination of woodworking literature published from 1914 to 1933. The literature is evaluated according to criteria based upon drawings, illustrations, printing, projects, technical terms, and usefulness.

3315. STOLFO, LEONARD A. ***An Annotated Bibliography of Professional Writings in Graphic Arts Education.*** **M. E., 1954, Wayne University. 34 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To compile a classified, annotated bibliography of selected professional writings in graphic arts education.

Source of Data: Data were selected from articles appearing in the Industrial Arts and Vocational Education magazine since 1928.

Findings and Conclusions: The bibliography is offered as an accomodation to stimulate reader-interest in the professional magazines, to provide a working tool available for teachers, and to furnish source material for graphic arts education.

3316. THALHAMER, GERALD E. ***A Selected Annotated Bibliography on Occupatioanl Information in the University of Colorado Libraries.*** **M. P. S., 1949, University of Colorado. 95 p. Library, University of Colorado, Boulder.**

Purpose: To compile an annotated list of references on occupational opportunities found in the University of Colorado Libraries to provide the reader with some indication as to how many of the 45 fields offered by the University of Colorado are represented in the list.

Source of Data: Data were obtained from the University of Colorado Libraries' card catalog

Findings and Conclusions: Information scarce in some field, none found in others. Recommended that all fields be represented in the University occupational information libraries. "This bibliography is offered as a service and counseling tool which should save time for both student and counselor. It is designed to simplify the task of the student in locating material and at the same time it should motivate him to seek it." The materials annotated were selected on the basis of the degree of conformation to major points set forth in "Content of Good Occupational Monographs" by the National Guidance Association, and also by the authority and reputation of the publisher.

3317. TRICHE, ANDREW, *Jr.* (M. S.). ***Bibliography on Industrial Teacher Training.*** **Pennsylvania State College, 1932. 52 p.**

A bibliography of pertinent books and references published after the passage of the Smith-Hughes Act and prior to 1932, relating to the preparation and training of industrial trade teachers. The author, title, publisher, date of publication, number of pages, and a brief summarizing statement are given.

3318. URBAN, ERNEST JOHN. ***Publications and Films on Basic Electricity—An Annotated Bibliography.*** **M. Ed., 1954, Wayne University. 32 p. Department of Industrial Education, Wayne University, Detroit, Mich.**

Purpose: To bring together books, motion pictures, and film strips in annotated form for teachers of basic electricity in school shops.

Source of Data: Data were obtained from book publishing companies and film producers.

Findings and Conclusions: No one book or film is recommended to the exclusion of another. Books and films should be reviewed and those selected which seem to meet the specific needs.

3319. WHEELER, WARD BRISBINE, *Jr.* ***Index of Lapidary and Jewelry Making Projects.*** **M. A., 1953, University of Minnesota. 45 p. Department of Industrial Education, University of Minnesota, Minneapolis.**

Purpose: To provide an index of projects for teachers, students, and homecraftsmen in the field of lapidary and jewelry making.

Source of Data: The projects listed in the report were taken from fifty books and magazines published recently.

Findings and Conclusions: Many "shop tested" projects do exist for any and every age group interested in lapidary.

3320. WHITE, A ROY. ***A Classified Catalog of Usable Textbooks and Closely Related Reference Books in the Field of Drawing—1933–1941.*** **M. S. in Ind. Ed., Kansas State Teachers College, 1942. 39 p.**

A comprehensive bibliography on drawing, cataloged by area and author. Evaluative criteria were used in determining the books to be included.

3321. WHITE, RICHARD HENRY. ***A Plan for a Self-Perpetuating Bibliography of Direct Related Materials Based on a Standardized List of Occupational Titles for Diversified***

Occupations. M. S., Oklahoma Agricultural and Mechanical College, 1945. 54 p.

A plan to keep a list of directly related occupational information up to date and in usable form.

3322. WIENER, MERLE O. *Research in Industrial Education For Advanced Degrees at Iowa State College Prior to 1950.* M. S., 1950, Iowa State College. 292 p. Library, Iowa State College, Ames.

Purpose: To provide an easily accessible reference to studies completed in industrial education at Iowa State College, and to ascertain trends in the type of studies conducted.

Source of Data: Data were obtained from these available in the Iowa State College Library, Ames.

Findings and Conclusions: The first graduate degree in industrial education was granted at Iowa State College in 1925. Prior to December 1949, the institution had granted 230 Master's degrees in industrial education. The largest number of degrees granted in one year was 26 in 1936. No definite trend was apparent in the type of study conducted. Most of the studies were in the areas of: teacher preparation, teacher duties, teacher status, teacher tenure, teacher salary.

3323. WILSON, CHARLES E. *Contributions to Industrial Education—Part I.* M. A., University of Minnesota, 1948. 71 p.

An index and summarization of each of 55 Plan B Papers (1 through 55) submitted by candidates for the M. A. degree, under plans without theses in the Department of Industrial Education.

3324. WOOD, CLARENCE R. (M.S.). *Syllabus for Beginning General Metal Shop.* University of Southern California, 1948. 132 p.

A syllabus designed specifically for general metal shop students at Lakewood Junior High School, Long Beach, California.

Certification, College Credit for Trade Experience

3325. ALLEN, ALFRED THOMAS (M. S.). *Interstate Certification of Industrial Arts Teachers for Secondary Schools.* Oregon State College, 1939.

A study to point up the factors regarding interstate certification opportunities. It attempts to form a basis for comparison of industrial arts programs between states, to guide prospective teachers, enlarge placement service, and promote an understanding of interstate problems.

3326. ARANT, THOMAS J. (Masters). *Certification of Industrial Arts Teachers in the Southern States.* George Peabody College, 1931.

3327. BELISLE, B. R. (M. S.). *Industrial Arts Teachers in the Secondary Schools of Connecticut, 1940–1941.* The Sout Institute, 1941. 85 p.

A comparative study of Connecticut secondary school teachers' training, experience, tenure, and certification, based on data secured from a questionnaire survey of 243 industrial arts teachers. Considers class load and extracurricular activities of these teachers.

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3328. DARDEN, BYRNES L. *A Study of the Industrial Arts Departments of the University and Colleges of Tennessee Which Offer Sufficient Curriculum for Teacher Certification in that Field at the Baccalaureate Level.* Ph. D., 1951, The Ohio State University. 307 p. Library, The Ohio State University, Columbus.

Purpose: To ascertain the amount and quality of training in industrial arts and to ascertain the need for and probable direction of further developments in industrial arts teacher education in the state of Tennessee.

Source of Data: The data were obtained through personal interviews, observations and a questionnaire to all staff members of the eleven teacher's colleges which offered work in industrial arts on the baccalaureate level.

Findings and Conclusions: There was a definite lack of a statement of purposes among the several institutions; however, the writer found through personal interview that they did operate within the philosophical frame of reference of each institution. There was considerable flexibility in the curriculum of each institution. General education and professional courses were adequate. The professional achievement of the staff members was deemed adequate but not outstanding. The physical facilities were judged to be good; likewise the instructional techniques employed. Most schools were found to provide good off-campus student teaching facilities with adequate supervision. The writer proposed a series of recommendations concerning the development of purposes, evaluation and revision of the curriculum, student personnel services, upgrading the staff, improved administrative practices, physical facilities and their improvement, instructional techniques, student teaching, placement and follow-up.

3329. DAUM, JOY (M. A.). ***A Comparative Study of Industrial Arts, Teacher Requirements, Certification, and High School Standards.*** **Miami University, Oxford, Ohio, 1947. 79 p.**

A comparative analysis of the electives and the curriculum context offered in the industrial arts teachers education programs. It includes the certification requirements and the program that is recommended in the 1937 Ohio High School Standards.

3330. DEJAIFFE, ERNEST (M. S.). ***A Survey of the Organization and Content of the Vocational Related Mathematics Program in General High Schools in the States of California, Illinois, New York, Ohio, and Pennsylvania.*** **Pennsylvania State College, 1947. 56 p.**

A survey of the existing conditions in the teaching of related mathematics in high schools with vocational departments. It considers state certification of teachers and the organization and content of the programs offered. A course of study in vocational related mathematics is presented.

3331. DEKOSTER, ROGER PAUL. ***Certification of Industrial Arts Teachers in the United States.*** **M. S., 1950, Iowa State College. 77 p. Library, Iowa State College, Ames.**

Purpose: To ascertain what requirements for certification of industrial arts teachers exist in the several States.

Source of Data: Certification requirements for high school industrial arts teachers for each of the 48 States during the years: 1927, 1935, 1939, and 1950 were used.

Findings and Conclusions: Requirements vary widely among the States. A need exists for standardization of the requirements. Progress is being made toward higher requirements and standardization.

3332. DOUGHERTY, VIVIAN CHANNING (M. S.). ***State Certification Requirements for Industrial Arts Teachers of the United States.*** **Indiana University, 1933. 104 p.**

The investigation collects and sets forth the certification provisions for teaching industrial arts in all the forty-eight states, for the year 1932.

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3333. EARHART, CECILIA RUTH. ***Requirement for Vocational Teacher Training and Certification in Trades and Industries in the Various States and Territories.*** **Ed. D., University of Cincinnati, 1946. 208 p.**

An analysis and comparison of the certification requirements of the vocational teacher-training programs in trades and industries of the several States and Territories; including eligibility requirements, pre-employment and in-service training courses, qualifications of supervisors and teacher trainers, and organization of courses.

3334. EDWARDS, CLAUDE RICHARD. ***Certification Requirements for Industrial Arts Teachers in the United States.*** **M. of I. A., 1955, North Carolina State College. 91 p. Library, North Carolina State College, Raleigh.**

Purpose: To ascertain the certification requirements for public school industrial arts teachers in each of the forty-eight states.

Source of Data: Data were collected through a form sent to the teacher certification office in each of the forty-eight states.

Findings and Conclusions: A college degree is essential in obtaining a basic certificate. The certification requirements lacked uniformity. Specific industrial arts subjects and credit hours were found to be an unimportant requirement. The types of certificates issued vary with each state.

3335. FRASER, ROLAND R. (M. A.). ***Certification of Industrial Arts Teachers in States Comprising the Wayne University Association Area.*** **Wayne University, 1944. 162 p.**

An analysis of certification requirements and recommendations for a uniform plan for the nineteen states in the North Central Association for issuing teaching certificates in industrial arts.

3336. FULLER, EMERY B. (M. A.). ***State Requirements for Certification of Teachers of Industrial Education.*** **University of Pittsburgh, 1933.**

An investigation of the problem of certifying teachers in industrial arts and vocational industrial education.

3337. HEARN, J. (Masters). *A Study of the Techniques Used to Determine the Trade Competency of Applicants for Vocational Certification in Pennsylvania.* University of Pennsylvania, C. 1935–47.

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3338. JACKEY, DAVID F. (Ph. D.). *An Evaluation of the Basic Curriculum of Vocational Teacher Training in Trade and Industrial Education in the State of California.* University of Pittsburgh, 1933. 192 p.

An investigation of the professional requirements of one state for the certification of its trade and industrial teachers. Attempts to evaluate the teacher training program on the basis of the data derived from teacher and supervisor judgment check lists.

3339. MAHOOD, SAMUEL C. (M. S.). *A Study of State Certification Requirements for Teachers in Evening Industrial (Smith-Hughes) Schools Throughout the United States.* Pennsylvania State College, 1930. 88 p.

An investigation and comparison of the certification requirements of evening industrial teachers throughout the United States. The need for standardizing these requirements throughout the various states is stressed.

3340. MANNING, LIONEL WALTER (M. S.). *The Interrelation of Teacher-Training, Salary Schedules, State Certification, and Advancement of Method for Industrial Arts in the Secondary Schools.* Orgeon State College, 1931. 67 p.

A comparative study of the professional implications of: teacher education, salary schedules, and certification standards, on advancement and professional development within the industrial arts field of secondary education.

3341. MEADER, EVERETT LAWRENCE (M. S.). *Study of the Colorado Agricultural College Plan of Vocational Teacher Training based on the Evaluation of Trade Experience in Terms of College Credits.* Colorado Agricultural and Mechanical College, 1935. 102 p.

A survey of students, superintendents, manufacturers, and the State Board of Education on the desirability and justification of granting college credits for trade experience.

3342. MOORE, JERRY WILLARD. *Automobile Mechanics Training at Shreveport Trade School and Employment Requirements.* M. Ed., 1950. Colorado Agricultural and Mechanical College. 65 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To study entrance requirements for automobile training compared with employment entrance requirement for beginning workmen.

Source of Data: Sources of data were shop foremen, former employees, instructors, shop owners. Subject matter included in the curriculum compared by employment knowledge and skills required.

Findings and Conclusions: Trade school training extends over too much of the field. Training should include more thoroughly the fundamentals a beginning workman needs to secure, and remain in employment, and leave advanced techniques to be learned on the job and by entering evening classes.

3343. MULHOLLAND, J. R. (M. S.). *State Certification Standards for Teachers of Industrial Arts, Vocational Education, and Related Subjects.* The Stout Institute, 1939. 181 p.

A compilation of the certification laws of each state in the United States as they are related to general minimum requirements, special minimum requirements for industrial arts teachers, and special minimum requirements for vocational teachers.

3344. MYRICK, FLOYD ALFRED (M. A.). *The Preparation, Certification and Selection of Industrial Arts Teachers in Maryland.* University of Maryland, 1942.

A presentation of the current practices in the preparation, selection, and certification of industrial arts teachers in Maryland, with recommendations to the State University for future practices in this area.

3345. OTTO, LEE W. *Teacher Certification for the Five Services of Vocational Education in the 48 States.*

M. S., 1953, University of Wyoming. 116 p. Library, University of Wyoming, Larimie.

Purpose: To present a summary and analysis of teacher certification for the services of vocational education in the 48 states.

Source of Data: Data were obtained from a review of the literature, and from communications with certification agencies in the 48 states.

Findings and Conclusions: There is no common pattern for certifying vocational teachers. Nine quarter hours is most frequently required for certificate renewal. Most of the 48 states required the Bachelor's degree for certification.

3346. PAWELEK, STANLEY J. (M. A.). *The Certification of Industrial Teachers—A Comparison of Minimum Standards for General and Vocational Certificates in all the States.* University of Minnesota, 1932. 88 p.

A comparative study of the requirements for certification of general industrial teachers, state and local supervisors of vocational education, instructors of related vocational subjects, and instructors of vocational shop work.

3347. REYNOLDS, RAYMOND WALLACE (M. S.). *A Study of the Acceptability of Industrial Arts Credits for College Entrance by High School Certificate.* Purdue University, 1946. 41 p.

A study to determine the amount of high school credits in industrial arts which are acceptable for college entrance. Data were obtained in 1941 and 1946 from 150 colleges, fifty each in engineering, teacher training, and liberal arts.

3348. SANDERS, GEORGE S. (M. Ed.). *Entrance Requirements and Procedures Used in Trade Schools.* Colorado Agricultural & Mechanical College, 1946. 213 p.

An investigation of the entrance requirements and procedures practiced by trade schools throughout the United States which meet the Smith-Hughes standards and receive Federal aid.

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3349. SAYOVITZ, JOSEPH JOHN. *Certification Status and Procedures for Industrial Arts Teachers in the United States.* Ph. D., 1955, University of Minnesota. 26 p. Graduate School, University of Minnesota, Minneapolis.

Purpose: To ascertain the certification requirements for industrial arts teachers on the state level for the year 1954.

Source of Data: Data were collected by means of a questionnaire, a study of state certification literature, and personal correspondence with state certification and supervisory personnel.

Findings and Conclusions: Complete data concerning the certification requirements for industrial arts teachers in all states were presented. Tabular presentations and comparisons were made for course and semester unit requirements indicating the type and magnitude of the requirements in each state. Information concerning the various ways in which industrial arts teachers were certified in the forty-eight states, major and minor requirements, types and terms of certificates, and other factors pertaining to state requirements was presented. The present status of interstate certification for industrial arts teachers and concepts relating to a fifty year period of training were discussed.

3350. SEGLEM, MARVIN H. *Minimum Certification Requirements for High School Industrials Arts Teachers.* M. S., 1952, Kansas State Teachers College. 43 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the state requirements for certification of industrial arts teachers.

Source of Data: Data were obtained from state departments of education.

Findings and Conclusions: Certification requirements were found with respect to professional courses, general education, industrial arts, and student teaching for all states except Georgia, Idaho and Vermont.

3351. SHERMAN, WILLIAM MARION. *Certification of Industrial Arts Teachers in the United States.* M. S., Iowa State College, 1939. 68 p.

An analysis of the certification requirements for teachers of industrial arts in each of the States in 1939.

3352. SIEDLE, THEODORE ANTHONY (M. A.). *Present Practices in Vocational Industrial Teacher Training Institutions of Granting College Credit for Trade Experience, for*

***Teaching Experience in Trade Schools, and for Supervisory and Administrative Experience in Vocational Education.* University of Pittsburgh, 1930.**

A study of college credit for trade, teaching, and supervisory and administrative experience.

3353. SMITH, EVERETT GORDON (M. S.). *College Credit for Trade Experience.* Louisiana State University and A & M College, 1947. 109 p.

A study of the institutional practices and the opinions of state supervisors and teacher trainers regarding the granting of college credit for trade experience. A plan for the evaluation of this experience is recommended.

3354. TAWES, W. I. (Masters). *A Study of the Qualifications of Vocational Industrial Shop Teachers in Pennsylvania and Delaware.* University of Pennsylvania, c. 1935–47.

3355. WHITTEN, BENJAMIN C. (M. S.). *Certification, Training and Employment of Industrial Arts Graduates of Negro Teacher Training Institutions in Ten Selected States.* Pennsylvania State College, 1948. 85 p.

Investigates the problems of future industrial arts teachers who receive their training at Negro teacher training institutions. The problems emphasized are state certification requirements, curricular offerings, and the future supply of and demand for Negro industrial arts teachers for the period 1948 to 1951.

3356. ZORETIC, THOMAS D. (M. A.). *Preparation and Certification of Industrial Arts Teachers.* Western Kentucky State College, 1946. 66 p.

A study of the preparation and certification of industrial arts teachers throughout the United States, based on a survey of questionnaires and college catalogs and bulletins. Charts and tables indicating comparison of industrial arts in most states are included.

Consumer Education

3357. ABE MINORU (M. S.). *An Analysis of Automobile Consumer Information.* The Stout Institute, 1947. 68 p.

A consideration of what the consumer should know about automobiles and what specific information should be included in high school consumer information courses. The study is based on literature in the field since 1935.

3358. BLY, LEWIS E. (Masters). *A Study of Domestic Artificial Refrigeration Devices: With Special Reference to the Consumer Objective in Secondary Education.* Ohio State University, 1932.

3359. BRATON, NORMAN RICHARD. *Consumer Education in Industrial Arts.* M. A., 1953, University of Minnesota. 106 p. Department of Industrial Education, University of Minnesota, Minneapolis.

***Purpose:* To show how a well planned industrial arts program can carry its share of the load in teaching consumer knowledges and skills.**

***Source of Data:* Data were obtained from magazine articles, books, unpublished materials, and reports.**

***Findings and Conclusions:* There is a definite need for more consumer information to be taught in our industrial arts classes. To aid instructors in accomplishing this, the area of woodworking was analyzed and presented in chart form showing the various steps. Teaching aids and sources of information are also included.**

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3360. BURDETTE, WALTER ELBERT, Jr. *The Contribution of Industrial Arts Instruction to the Consumer Knowledge Possessed by Students of Central Minnesota.* Ed. D., 1955, University of Missouri. 135 p. Library, University of Missouri, Columbia.

***Purpose:* To ascertain the extent to which industrial arts instruction has contributed to the consumer knowledge possessed by high school boys, concerning the selection, use and care of industrial products.**

***Source of Data:* A specially constructed consumer knowledge instrument was used to examine 791 high school senior boys of twenty selected Central Minnesota public high schools which offered industrial arts instruction. Raw scores for the American Council on Education Psychological Examination were made available by the administrative officials of the cooperating schools.**

Findings and Conclusions: The extent of influence of industrial arts instruction on the consumer knowledge relating to industrial products, possessed by high school boys of low scholastic aptitude, was found to be low. The extent of influence of industrial arts instruction on the consumer knowledge relating to industrial products, possessed by high school boys of somewhat higher, but still below average scholastic aptitude, was found to be low, but more nearly approaching moderate effectiveness. As the scholastic aptitude of the high school boys more nearly approximates the average, the contribution of industrial arts instruction to the consumer knowledge possessed can be expected to be moderate in extent.

3361. BURFORD, WESLEY ROY (M. S.). *Consumer Information Needed by the Prospective Home Owner.* Oregon State College, 1947. 90 p.

A study, based on questionnaires to home owners, prospective home owners, and building contractors, which attempts to determine the need for more consumer education for home owners in high school and in adult education classes.

3362. BYRNE, ANTONIA MARIE. *An Economic Analysis of "The Consumer Education Series."* M. A., St. Louis University, 1948. 126 p.

A general evaluation of the contributions of the authors of the "Series" for the development of more intelligent, effective, conscientious consumers.

3363. DANIELS, THAXTER NORMAN (M. S.). *A Study of Some of the Consumer Values To Be Derived From Home Planning Procedures.* Oregon State College, 1940. 147 p.

The selection of instructional material in home planning for consumers based upon survey of problems as revealed by home owners, contractors, and builders in San Jose, California and vicinity.

3364. EDWARDS JAMES FLOYD. *Consumer Education in Industrial Arts.* M. S. in Ind. Ed., Kansas State Teachers College, 1940. 56 p.

Significant statements bearing on needs, principals, goals, and practices in consumer education.

3365. HALE, WILLIAM P. (M.S.). *Mechanical Drawing Content Based on Consumers' Needs.* Iowa State College, 1932. 65 p.

An analysis of 102 newspapers from various parts of the country, 60 copies of magazines, 56,590 pages in school textbooks and 126 advertisements. A grand total of 2,504,488 square inches of printed material was analyzed, and the percentage of the various kinds of drawing were determined. The results are presented in both tabular and graphical form.

3366. HUNT, DEWITT TALMADGE (M. A.). *A Study of the Term "Consumers' Knowledge" and Its Use as an Industrial Arts Objective.* Ohio State University, 1931. 148 p.

A study uncovering the present trend in education concerning consumer knowledge with suggestions for future programs. The universality of the term "Consumers' Knowledge" is considered and an effort is made to define the term and evaluate its importance by a sociological study.

3367. KELLY, RAY E. *Instructors' Guide Sheets for Consumer Economics.* M. S., Oklahoma Agricultural and Mechanical College, 1946. 65 p.

A guide for the teaching of consumer economics to students in diversified occupations programs.

3368. O'CONNOR, WILLIAM D. *Consumer Education Taught by Industrial Education Teachers of Iowa.* M. S., 1949, Iowa State College. 63 p. Library, Iowa State College, Ames.

Purpose: To determine the extent of the teaching of consumer education being offered by industrial education teachers. To determine the methods being used to teach consumer education. To survey the industrial education teachers to indicate opinions concerning the need for consumer education and the suggestions they have for the teaching of consumer education.

Source of Data: A check list was sent to all Iowa high schools teaching industrial arts education or vocational industrial education.

Findings and Conclusions: Very little consumer education is being taught in Iowa secondary schools. The home economics teachers are taking the leadership in the teaching of consumer education. Ninety-seven percent of the industrial education teachers believe that consumer education should be emphasized and believe that future teachers should be required to study consumer education in college.

3369. PAULI, ROSS I. *Consumer Education in Relation to Industrial Arts.* M. S. in Ind. Ed., Kansas State Teachers College, 1947. 128 p.

A discussion of social and economic factors involved in consumer education.

3370. PETERS, JAMES GORDON. *Plywoods and Veneers—Their Place in Industrial Arts.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 64 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To organize information for the use of shop teachers and for the consumer.

Source of Data: Compilation of material taken from publications furnished by plywood and veneer associations and by manufacturer and distributors of plywood materials, and from 4 reference texts.

Findings and Conclusions: An attempt has been made to compile information on plywood materials which might be of value to shop teachers both in the selection of materials for use in the shop as a source of information which can be used in supplying related information on the materials of industry. Includes a brief history of plywoods and veneers, something of the general characteristics of these materials, some phases of plywood manufacture, and some of the recent developments in the plywood industry.

3371. PUCEL, JOSEPH LOUIS. *Household Electrical Devices Consumer Information Sheets.* M. A., 1954, University of Minnesota. 151 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To construct consumer information sheets for household electrical devices.

Source of Data: Data were obtained from books, journals, pamphlets, and monographs.

Findings and Conclusions: Consumer information sheets covering household electrical devices are included. Consumer information in other industrial arts areas is needed.

3372. RINGER, ROBERT T. *An Analysis Of Furniture Construction With Special Reference To Consumer Education.* M. A., 1953, The Ohio State University. 134 p. Library, The Ohio State University, Columbus.

Purpose: To examine furniture styles and construction, to record the characteristics of low, medium, and high priced furniture, and to ascertain how the findings can be used to fulfill the consumer and appreciation aims of industrial arts education.

Source of Data: Data were obtained from literature and visits to furniture factories.

Findings and Conclusions: A series of recommendations was formulated to indicate how the information gathered by the writer could be used to better fulfill the aims of industrial arts education.

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3373. SCHMITT, MARSHALL LANGDON. *A Study to Determine Course Content in Consumer Education for Industrial Arts Based on Selected Durable Goods.* Ed. D., 1953, The Pennsylvania State University. 160 p. Library, The Pennsylvania State University, University Park.

Purpose: To ascertain course content in consumer education for industrial arts based on a selected list of frequently purchased durable goods, findings from certain manufacturers, and a group of outstanding industrial arts teachers.

Source of Data: A group of durable goods and a sampling of manufacturers of those durable goods were selected and from them were obtained facts and information important to the selection, use and care of the goods. Learning activities based on these facts were validated by a jury and submitted to a group of selected outstanding teachers for evaluation.

Findings and Conclusions: Seventy-eight per cent of the respondents indicated that consumer education in industrial arts is a combination of informational and manipulative work. Two techniques are offered for teaching consumer education in industrial arts. In the first, the information is brought in when needed during the regular class and/or shop period. In the second, a combination of a teaching unit with a certain amount of time set aside to meet the specific consumer objective is used. Certain learning activities were found by the respondents to be very important as curriculum content in industrial arts. These were also checked as being taught now, and it was indicated that they could be done in industrial arts shops better than in any other course.

3374. STROMBOM, LELAND G. (M. S.). *Consumer's Course in Home Engineering.* The Stout Institute, 1941. 61 p.

A survey of eighty-four people in Sycamore, Illinois, to determine their needs in electricity, woodwork, metalwork, and finishing. A course of study in home engineering based on these needs is proposed.

3375. SURFORD, WESLEY ROY (M.S.). *Consumer Information Needed by the Prospective Home Owner.* Oregon State College, 1947. 90 p.

A study, based on questionnaires to home owners, prospective home owners, and building contractors, which attempts to determine the need for more consumer education for home owners in high school and in adult education classes.

3376. SWINEFORD, GLENN L. *Consumer Literacy in Furniture Selection—Methods for Evaluating Household Furniture.* M. A., 1948, Ohio State University. Education Library, Ohio State University, Columbus.

Purpose: To examine the factors that are involved in making an intelligent selection of furniture; to develop a set of valid criteria which the consumer can use; and to determine a criteria most effectively demonstrated through activities in industrial arts courses.

Source of Data: Major factors involved in economic and personal structure of society are analyzed, evaluative criteria for analyzing furniture proposed and analysis of physical composition and construction as illustrated in industrial arts courses developed.

Findings and Conclusions: Industrial arts should provide an opportunity for students to plan furniture projects which will contribute to their knowledge of sound principles of design; to acquire consumer knowledge concerning the relative merits of various types of furniture construction and thereby as discerning consumers stimulate the production of high quality functional furniture.

3377. WICKLER, HOWARD O. *Consumer Education in Industrial Arts.* M. A., 1953 University of Minnesota. 54 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To emphasize the importance of teaching consumer education in industrial arts.

Source of Data: Data were obtained from city and state bulletins, magazine articles, and books on philosophy and objectives of industrial arts.

Findings and Conclusions: Industrial arts objectives will be achieved to a greater degree as consumer education is made an integral part of the instructional program.

Philosophy

3378. ABERCROMBIE, TOWNE R. (Masters). *New Conceptions of Industrial Arts and Their Implications for General Education.* University of Cincinnati, 1946.

3379. ANDERSON, W. CARLISLE. *Industrial Arts in Elementary Schools.* M. A., 1942, University of Minnesota. 87 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To examine current philosophy concerning industrial arts at the elementary school level and to make recommendations regarding the inclusion of this experience area in the curriculum.

Source of Data: Data were obtained from books and magazine articles, courses of study and manuals.

Findings and Conclusions: Acceptable objectives are being developed for this elementary school instructional activity. Classroom activity in the industrial arts under the direction of the regular teacher seems to be preferred at this level. Introduction of more work requiring tools and materials seems desirable.

3380. ANDERSON, WILLIAM JAMES. *A Study of the Philosophy of Rousseau Concerning the Practical Arts and His Influence on the Philosophy of Industrial Arts in the Secondary Schools of the United States.* M. S., 1950, North Texas State College. 55 p. Library, North Texas State College, Denton.

Purpose: To trace the influence of Rousseau's philosophy on the practical arts and industrial arts in the secondary schools of the United States.

Source of Data: Data were secured from Rousseau's writings, and as comparison was made with the philosophy of industrial arts during the present era. The methods of present general education and practical arts education were compared to the methods proposed by Rousseau.

Findings and Conclusions: The philosophy of industrial arts today is the same as the basic theory of Rousseau, "learning by doing." The educational foundation of all industrial arts work in the schools is still that expressed by Rousseau.

3381. BAILEY, CLAIR V. (M. S.). *Industrial Arts in Progressive Education.* Oklahoma A & M College, 1940. 117 p.

A survey of some of the schools participating in the eight year study to determine the effect of progressive education practices upon the industrial arts programs, as of 1940. The study shows the contribution industrial arts makes to the whole school program, with special references to individual instruction.

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3382. BAILY, ATHOL ROMAYNE. *Evolving Concepts of Industrial Education in the Thinking of Organized Industrial Management.* Ed. D., 1949, University of Missouri. 215 p. Library, University of Missouri, Columbia.

Purpose: To trace the evolution of the concept of industrial education in the thinking of selected industrial employer associations from 1880 to 1949 and to suggest implications in the operation of programs of industrial education.

Sources of Data: A study was made of the Proceedings of Annual Conventions and official journals of the National Association of Manufacturers, National Metal Trades Association, United Typothetae of America, National Association of Builders of the United States of America, and the Associated General Contractors of America.

Findings and Conclusions: Historically, the employer has been responsible for training of industrial workers. The schools, until recently, confined their efforts to academic training for those who were to enter the professions. The basic idea underlying management's interest in industrial education is economics. Training should be open to all who can profit by the training. Management has supported industrial education for upgrading workers already employed, but has not insisted that this instruction be supplementary to their daily employment. According to management, the public schools should provide a broad, basic, fundamental and well rounded education, and an effective guidance program for future workers, and accepts the responsibility of providing the highly specialized training required of workers, in the belief that this phase can be best done on the job. Management is more interested in training during labor shortages. Interest can be expected to subside when the urgency ends. Management, much earlier than labor, took an active part in the national movement for vocational education. Management's original opposition to labor's participation in industrial education was due to the fact that it wanted to control the training and the supply of workers. This attitude, however, has changed and management now holds that a sound program of industrial education can be carried on only when a cooperative working relationship is maintained among management, labor and the educator.

3383. BECK, ELWIN RUSSEL (Masters). *Concepts of Industrial Teachers With Reference to Certain Phases of the Industrial Arts Program.* Iowa State College, 1939.

3384. BELL, MARVIN RONALD (M. A.). *A Statement of Suitable Objectives for an Industrial Arts Department in a Teachers' College.* Indiana State Teachers College, 1947. 56 p.

A statement of objectives for an industrial arts department in a teacher training institution. A tendency for agreement on most of the topics by the 127 heads of departments who co-operated in the study was noted.

3385. BERRY, MILLARD LAVERNE. *An Interpretation of the Responses of Fifteen Industrial Arts Men in Positions of Authority Relative to Fifty-seven Industrial Arts Issues.* M. S., Iowa State College, 1939. 137 p.

A study of opinions of leaders in the industrial arts fields on industrial arts issues.

3386. BLACKBURN, GEORGE WELDON. *The Educational Philosophy of Frederick Gordon Bonser, with Special Emphasis Upon Industrial Arts.* M. S., 1953, North Texas State College. 150 p. Library, North Texas State College, Denton.

Purpose: To examine Frederick Gordon Bonser's Philosophy concerning industrial arts.

Source of Data: Data were collected from the writings of Bonser and from literature concerning his work in education.

Findings and Conclusions: Bonser conceived of industrial arts as a vital and essential phase of the total program of education. He believed that industrial arts experiences should be available to both boys and girls beginning in the elementary grades and continuing through the secondary level. His philosophy of industrial arts is compatible, in the main, with the prevailing philosophies of industrial arts as set forth by leaders in the field today.

3387. BRISCO, CHARLES C. ***Industrial Arts Vocational Education.*** **M. A., Claremont Colleges, 1940. 134 p.**

A subjective analysis of the position of industrial arts and vocational education in our social economic life and a summation of the pertinent factors contributing to the success of industrial education programs.

3388. BROWN, EVERETT MOORE (M. A.). ***The Enrichment of Instruction in the Industrial Arts Subjects Through Supplementary Reading.*** **University of Southern California, 1933. 88 p.**

A study concerning the aims, methods, and materials which might be used to enrich instruction in industrial arts subjects.

3389. CALLAN, LOUIS JOHN (M. A.). ***Orientation Functions of Industrial Arts.*** **Ohio State University, 1937. 143 p.**

A survey of the possibilities for orientation through adaptation of the New York State Course of Study on Industrial Arts. It reviews the historical and philosophic basis in adapting a general course of study to a specific school situation.

3390. CAMPBELL, CHARLES E. (Masters). ***The Psychology of Freedom of Expression in Secondary School Arts and Crafts.*** **University of Michigan, 1941.**

3391. CARLSON, V. WILLIAM. ***Educational Philosophy and Industrial Education.*** **M. A., University of Minnesota, 1942. 95 p.**

A canvass of the philosophy of progressives, essentialists, authoritarians and reconstructionists as to how they treat industrial arts and vocational education.

3392. CROMER, HIRAM F. ***The Philosophical, Psychological, and Sociological Bases for an Industrial Arts Program,*** **M. A. 1949, University of California. 132 p. Lange Library, Haviland Hall, University of California, Berkeley.**

Purpose: To establish justifiable and valid claims or guiding principles for an industrial arts program in our secondary schools.

Source of Data: The following plan and sources of information were used: a review of the history of manual activities in America; and a thorough study of the contributions made for industrial arts by outstanding educational leaders in philosophy, in psychology, and in sociology.

Findings and Conclusions: Listed factors which have been instrumental in the development of manual activities in our schools. Guiding principles for constructing an industrial arts program: industrial arts is concerned primarily with general education and its main purpose is to present a program that is broad enough to prepare individuals to live and to serve well in today's work and world; industrial arts aid in channeling an individual's tendency to construct; promote the socialization of the individual; develop orderly, systematic procedures; provide exploratory opportunities through experiences; develop skills and techniques; develop an understanding of workmanship, taste, good design, etc.; gives purpose and direction to activity; develops knowledge of industrial procedures; stimulates problem-solving attitudes; promotes worthy use of leisure time.

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3393. DASGUPTA, DEBENDRA CHANDRA (Ed. D.). ***The Place of Vocational Education in Modern Educational Theory from the Sixteenth to the Twentieth Century.*** **University of California, Berkeley, 1932. 224 p.**

A study giving the educational thinking of famous educators and philosophers regarding vocational training in the schools. A review of the writings of eminent people interested in education from the sixteenth to the twentieth centuries is included.

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3394. DAVIS, WARREN C. (Doctors). ***The Philosophical Element in a Technical Program: A Study of the Philosophy Course at the Rochester Athenaeum and Mechanics Institute.*** **University of Buffalo, 1936.**

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3395. DYKEHOUSE, JAY. ***Dualism in American Public Education Since 1906, with Special Reference to the Vocational Educational Movement.*** **Ph. D., 1950, University of Michigan. 306 p. Geenral Library, University of Michigan, Ann Arbor.**

Purpose: To present the beliefs, attitudes, purposes and educational philosophy of certain persons, groups and organizations active in the promotion of Federal and State legislation for vocational education, from approximately 1906 to present.

Source of Data: The data of the investigation were obtained from letters, interviews and documents concerning the educational philosophy and plans of groups working on legislation for vocational education. A special study of dualism in Wisconsin was made by correspondence with educators in that State.

Findings and Conclusions: The findings indicated that many of the early leaders in the vocational education movement, especially the writers of the Douglas and Wisconsin reports, had in mind a dual system of schools similar to that operating in Germany. The results also indicate that the vocational educational movement was sponsored primarily by economic rather than by educational groups. The refusal of the academic educators to meet demands for vocational education forced other groups to obtain national legislation, hence, the Smith-Hughes Act in 1917. Over 32 years of Smith-Hughes and related legislation reveals two trends with respect to vocational education. One is a trend toward State and Federal control, which combined with other factors leads to a separation of vocational from general education. The other is a growing commitment to a unified approach which combines vocational education in an integrated program of instruction, which is a stronger trend than that toward dualism.

3396. EMMICK, JAMES NORMAN. ***Reading Interest in Industrial Arts at the Elementary Level.*** **M. A., Ohio State University, 1948. 110 p.**

A philosophical study of children's reading interests and the development of written instructions that reflect the factors of children's reading interests.

3397. ENGLEBREKTSON, SUNE. ***Sloyd: The Foundation of Industrial Arts Education.*** **M. A., 1949, New York University. 119 p. Library, New York University, New York, and Library of Congress.**

Purpose: To interpret the philosophy of Otto Salomon by giving the historical background, translation of essays, investigation of personalities and methods that have been synonymous with the Sloyd movement at Naas, Sweden.

Source of Data: The author personally visited Sweden where he did research and translations in the environment of the Naas system. Photographs taken on the spot are used to illustrate localities and examples of Sloyd craftsmanship. Projects now being used are listed for various grades and the present day philosophy of promoting the "dignity of work" through the medium of Sloyd education is discussed. Seventeen books are listed in the bibliography; most of which are either translations or written in Swedish by men identified with the history and development of Sloyd education.

Findings and Conclusions: The author through his own background and education has been able to evaluate the information received during his investigation. The results clearly bring out the basic theory of Sloyd which is "children should be learning through personal experiences."

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3398. FALES, ROY G. ***Industrial Arts in General Education.*** **Ed. D., 1948, New York University. 210 p. Library, New York University, New York, and Library of Congress.**

Purpose: To bring out for consideration the basic principles of industrial arts education and to survey the present programs in New York State. Good practices are recommended and trends indicated.

Source of Data: The thesis is the result of: Compilation of experiences (by the author) over 15 years; conferences with school administrators and shop teachers; statistics gathered from sereval sources such as reports, bulletins, and questionnaires; a group of bulletins originally distributed by the author in 1940 were criticized by instructors, rewritten and reissued in 1944. These bulletins are the basis for this document.

Findings and Conclusions: The document deals with the history and development, the philosophy and objectives, planning and methods of instruction of industrial arts, and curriculums and their interpretation at various grade levels. Forty-six principles and practices are listed as a summary for the document. Some of them selected at random are as follows: Industrial arts as a school subject was developed in 1909. It has increased in usage since that time. It is not unusual for pupils to find recreation, play and hobby interests in the industrial arts work. The comprehensive general shop (not course) is particularly well adapted for a school employing only one industrial arts instructor. Emphasis can be placed on learning to plan and think through problems by causing pupils to plan, insofar as is possible, every article which they construct in the shop. Eleven trends are listed; several being as follows: Industrial arts shops are becoming much larger. A pupil-personnel management plan is usually a part of every shop organization. . . . A fuller understanding of the pupil-personnel plan is . . . developing slowly among teachers and teacher-trainers. Organized group instruction has always been a part of all school shop work. It will always be necessary otherwise . . . the shop experience is nothing but a "trial and error experience." The bibliography consists of 29 pages and includes practically all of the books and articles that have been published and that might be considered contributions to the subject.

3399. FOX, NELSON HENRY (M. S.). *Ceramics as an Experience Area in the Industrial Arts Program.* Oregon State College, 1948. 73 p.

A philosophical comparison of the values inherent in ceramics crafts with recognized objectives of industrial arts. Conclusions and recommendations are included.

3400. GENTHER, WILLIAM L. (Masters). *The Psychology of Shop Work.* Rutgers University, 1931.

3401. GOVIN, CHARLES T. *Industrial Arts and General Education.* M. A., University of Minnesota, 1948. 79 p.

A study of the relationships between industrial arts and general education in terms of the contribution of industrial arts to the objectives of general education.

3402. GUINN, JAMES H. (Masters). *The Amateur Spirit in the Industrial Arts.* East Texas State Teachers College, 1938.

3403. HAGEN, BERNHARD C. (M. S.). *Life and Educational Philosophy of Lorenzo Dow Harvey.* Iowa State College, 1937. 120 p.

A review of the life of Dr. Harvey from his birth on a New Hampshire farm through his educational experiences and career as an educator with special emphasis upon his connections with Scout Institute. Approximately half of the text is composed of his educational philosophy.

3404. HAND, WILLIAM PORTER (M. A.). *Views of Certain Sociologists Concerning Vocational Education and Vocational Guidance.* East Texas State Teachers College, 1939. 149 p.

A study of selected writings of certain sociologists to ascertain their views concerning the importance of vocational education and vocational guidance to general education, and to determine where these sociologists would place these subjects in the school program. The significance of the opinions of this group of writers is discussed.

3405. HARMON, RALPH M. (M. S.). *A Survey of the Comprehensive General Shop—A Study Dealing with the Philosophy and Activities of a Comprehensive General Shop.* The Stout Institute, 1941. 47 p.

A study, based on a survey of the literature in the field, which outlines the philosophy and objectives of the comprehensive general shop. It also presents the background for a list of activity areas.

3406. HAWKINS, ROBERT W. (Masters). *The Aims of Industrial Education.* Wayne University, 1943.

3407. HOBLIT, P. ARTHUR. *Habits and Attiudes in the Industrial Arts Shop.* M. A., University of Minnesota, 1948. 69 p.

A study of pupil and instructor understandings, trials, and accomplishments in the realm of habits and attitudes in industrial arts instruction.

3408. HOGER, WESLEY V. G. (M. Ed.). *A Comparison Between Industrial Arts and Vocational Courses in Auto Mechanics.* Colorado Agricultural & Mechanical College, 1948. 170 p.

An investigation of the philosophies and objectives of both vocational education and industrial arts. Eight courses in each field are compared and differences and simliarities are noted.

3409. HORNBAKE, R. LEE (Masters). *Industrial Arts in the Elementary School.* Ohio State University, 1937.

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3410. HORNBAKE, R. LEE (Doctors). *Dualisms in Education.* Ohio State University, 1939.

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3411. HUXOL, ROBERT LYON. *The Relationship Between the Contemporary Philosophy of Industrial Arts Education and Current Practice in Selected Indiana Schools.* Ed. D., 1954, Indiana University. 275 p. Library, Indiana University, Bloomington.*

Purpose: To reveal whether or not the philosophies of industrial arts, as presented by acknowledged leaders were consistent with the industrial arts practices existing in typical secondary school shops.

Source of Data: Data were obtained by interviews.

Findings and Conclusions: Administrators recognize the value of an adequate personnel policy, provide budgetary procedures relative to acquisition of supplies, keep the public informed relative to the school curricula, and encourage a professional attitude among the staff toward industrial arts. They have not yet accepted the idea that industrial arts courses may possess merit for both boys and girls. The practice of providing a written course of study is rather limited. In general, industrial arts shops appeared to be well-planned, adequately supervised, and properly maintained.

3412. KAY, LELAND OLIVER. *An Analysis of the Works of Pestalozzi in Education and His Philosophy Concerning Practical Arts.* M. S., 1950, North Texas State College. 59 p. Library, North Texas State College, Denton.

Purpose: To examine Pestalozzi's philosophy of the practical arts and the influence of his educational experiments on the work in the public schools of this country.

Source of Data: Pestalozzi's philosophy of the practical arts was outlined, using historical documents, and influences pointed out.

Findings and Conclusions: Pestalozzi was considered an educator rather than a philosopher. His ideas and work lead to many changes in the schools of his time and later. Chief among his contributors were the following: Democracy in education—he induced kings and rulers to take an interest in the education of indigent children; application of psychology to education—he advocated life activities to develop, unfold and strengthen the child's mind; the concept of organic education—a simultaneous development of head, hand and heart; the ideas that the concrete should precede the abstract in learning; and the idea of analysis as a basis for method.

3413. KLAMMER, WALDEMAR E. *A Survey of the Philosophy and Organization of Area Vocational Schools.* M. S., 1950, The Stout Institute. 99 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To determine the philosophy and organization of area vocational schools.

Source of Data: This study is based upon a nation-wide survey with emphasis on the location of area vocational schools, why there is a need for them, and what they are doing to provide more adequate vocational training for their service areas. The names of area vocational schools were obtained from the various state departments of vocational education. Seventy-seven schools from twenty States cooperated by answering a short questionnaire and sending catalogues, bulletins, reports, and other printed materials.

Findings and Conclusions: The survey includes schools designated as area schools. The data may be useful as a guide for effective planning or improving of an area vocational program.

3414. LOVEGREN, LAWRENCE ALFRED (M. S.). *An Investigation of Some Foundational Factors as a Basis for Improvement of the Corvallis Junior-Senior High School Industrial Arts Department.* Oregon State College, 1937. 192 p.

A survey of selected foundational factors—in the schools, the homes, the community, industrial occupations, and educational philosophies—as a means of projecting a program of improvement for industrial arts in the high schools of Corvallis, Oregon.

3415. LOWE, E. L., Jr. *A Study of G. Stanley Hall's Philosophy of the Pratical Arts and His Influence on the Philosophy of Industrial Arts in the United States Today.* M. S., 1952, North Texas State College. 82 p. Library, North Texas State College, Denton.

Purpose: To review the literature concerning G. Stanley Hall's philosophy of the practical arts; to ascertain the extent to which Hall's philosophy has influenced the philosophy of industrial arts.

Source of Data: Hall's philosophy of the practical arts was analyzed and compared with the prevailing philosophy of leaders in industrial arts.

Findings and Conclusions: Much similarity exists between the philosophy of G. Stanley Hall's philosophy of the practical arts and the philosophy of industrial arts as currently held by leaders in the field. Hall's theory concerning the adolescent, how he grows, develops and learns is not compatible with current theory.

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3416. LUDINGTON, JOHN ROBERT (Ph. D.). *Industry and Education—A Study of Certain Policies and*

Practices of Organized American Industry with Implications for Education. Ohio State University, 1940. 236 p.

A study of the interrelations of social forces and social institutions to determine the extent to which organized industry is interested in American public education. The role of public education in an industrial society is considered.

3417. MACQUARRIE, WILLIAM DEAN (M. A.). *New Projects for the General Shop.* Stanford University, 1936. 110 p.

An analysis of the general shop including the philosophy and present practices for operation. New projects and suggested changes for established projects are included.

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3418. MAYER, HERBERT C. (Doctors) *Democratic Vocational Education.* Harvard University, 1941.

3419. MEULER, MILTON CARL (Masters). *The Extent to Which Industrial Arts Contributes Toward the Recognition of Aesthetic Qualities in Industrial Products.* Iowa State College, 1939.

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3420. MEYER, HARVEY KESSLER. *Curriculum Design in Technics; A Concept With Industrial Arts Its Origin.* Ed. D., 1951, University of Florida. 478 p. Library, University of Florida, Gainesville.

Purpose: To trace some theories of mind as they apply to technics, the doctrine of the arts in general, and to develop a curriculum with examples of implementation.

Source of Data: Data were obtained from studies and published materials relating to the problem, interviews with leaders, technical materials from several fields, and empirical data as a result of experience.

Findings and Conclusions: Industrial education continues to pay subservience to an outworn tradition of disciplinary transfers. Technics education seeks and finds a different basis. Some of the fundamentals in this concept are that mind is a function; that learning is a reconstruction of experience through experience; that democracy is supra-political, a values system; that the abundant life is derived from everyday concerns; that education dare not ignore these terms; that technics, home, abundance, community, and school are a continuum.

3421. MILLER, FLOYD H. (Masters). *Educating American Children for a Complex Industrial Society Through a Program of Industrial Arts Education.* Ohio State University, 1941.

3422. NAVE, DELBERT P. (M. A.). *Industrial Arts From the Viewpoint of Gestalt Psychology.* Ohio State University, 1939. 128 p.

A study of industrial arts and its relation to Gestalt psychology in an effort to evaluate the many practices carried on in the name of industrial arts. The adequacy of arbitrarily chosen problems to meet the needs of the individual is considered.

3423. NEUBAUER, G. W. *A Summary of Available Literature in the English Language on the Historical Development and Present Status of Education in Brazil.* M. S., The Stout Institute, 1944. 113 p.

A study dealing with the philosophy that guides Brazilian educational practice especially with reference to industrial and vocational education.

3424. NEWTH, CARROLL RUBLE (M. S.). *Comparative Training Values of the Various Industrial Arts Activities and This Influence on the Industrial Arts Program of the High School.* Oregon State College, 1934. 63 p.

An evaluation of seventy-one industrial arts subjects as rated against nine accepted industrial arts objectives to determine which areas in practice contribute most to the acepted objectives. Some attention is directed to curriculum building and to the nature of and time allotments for various pupil activities.

3425. OBENLAND, ALMA MARIE (Masters). *Relationships Between Industrial Arts and Home Economics.* Ohio State University, 1938.

3426. OGLESBY, LAWRENCE H. *Industrial Arts General Shop as General Education.* M. Ed., 1953, University of Florida. 90 p. Library, University of Florida, Gainesville.

Purpose: To gather information from the fields of science, social studies, language arts, mathematics, and philosophy to test the hypothesis that industrial arts is one of the principal sources of a well-rounded general education.

Source of Data: Data were secured from texts and study guides of the state departments of education of several states.

Findings and Conclusions: The general shop, through the wide range of experiences offered, serves the objectives of general education. The industrial arts general shop is well adapted to the philosophy of education that emphasizes "learning by doing."

3427. OLSTAD, HARRY B. (M.S.). *Analysis of the Philosophies for Industrial Arts Education—Suggested Objectives for Wisconsin Co-operative Educational Planning Program.* The Stout Institute, 1946. 101 p.

A compilation of the opinions and recommendations of leaders in the field of industrial arts. The philosophies and objectives of industrial arts, as they apply to the program in general, in elementary and in secondary education are considered.

3428. OLSON, DELMAR WALTER (M.A.). *A Classification of Industrial Arts Subject-Matter: Derivation of Activity Areas for Laboratory of Industries*. Ohio State University, 1937. 88 p.

A curriculum study of the objectives of the various areas of industrial arts. The application of the areas to the needs of the individual pupil, the teacher, industry, the school, the community, and to other studies is treated.

3429. OSBORN, CARROLL A. *William Morris: His Contribution to Industrial Arts.* M. A., 1950, Ohio State University. 87 p. Education Library, Ohio State University, Columbus.

Purpose: To discover how William Morris contributed to the philosophy and practice of industrial arts education and to summarize his work for students concerned with project design and the history of industrial arts.

Source of Data: A summary of the life and work of William Morris.

Findings and Conclusions: Even though Morris's contributions were cheapened in the early 1900's, his philosophy concerning art still has basic values in project design in industrial arts education.

3430. OTT, WALTER HERBERT (M.S.). *Industrial Arts and the Integrative Curriculum.* Oregon State College, 1935. 71 p.

An appraisal of efforts at integration of the core subject areas. The difficulties of measuring results of attitudes, habits, and ideals are noted. The author suggests that measureable results may be gained by the use of an active motivating center in the practical arts areas.

3431. PERSONS, ALICE ELLEN (M.A.). *A Philosophy of Vocational Education.* University of Southern California, 1931. 89 p.

A general discussion of a philosophy of vocational education, based upon selected concepts of early and modern writers.

3432. POPE, EUGENE BLAIR (M. S.). *Status of Industrial Arts in Oklahoma Schools in 1938 and Suggested Statements of Controlling Philosophy.* Oklahoma A & M College, 1938. 39 p.

A survey of opinions of a group of leaders concerning the philosophy and objectives of industrial arts in Oklahoma in 1938.

3433. PRIODE, WALTER E. (M. Ed.). *An Analysis and Comparison of Objectives as Stated by Authorities on Industrial Arts.* Ohio State University, 1946. 81 p.

A comparison of the objectives of industrial arts as stated by several authorities in the field. The objectives as stated in the A. V. A. Standards of Attainment Bulletin are used as a standard with which to compare the objectives as stated by several other authorities.

3434. RAINBOW, JAMES ROBERT. *An Investigation of the Relationship Between the Industrial Arts and Guidance Programs.* M. A., 1954, University of Minnesota. 98 p., Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To formulate a sound philosophy of guidance for the industrial arts teacher, to identify the benefits he can receive from the guidance program, and emphasize ways in which he can and should provide guidance services.

Source of Data: Data were obtained from a review of the literature in guidance and industrial arts.

Findings and Conclusions: The report gives the philosophies of guidance and industrial arts, followed by four specific types of guidance which can be carried on profitably in the shop—vocational, educational, recreational, and personal.

3435. RAY, JOHN P. (Masters). *Justification of Industrial Arts in the Rural High School Courses.* Ohio State University, 1934.

3436. RITZMAN, EMMA M. *Stage Art: Its Educational Implications.* M. A., Colorado State College of Education, 1936. 159 p.

An investigation of present current philosophies, objectives of stage art, and the possibilities of stage art in an educational program, especially as a part of the offerings in industrial arts.

3437. SCALES, M. C. (Masters). *Some Contributions Which Industrial Arts Has Made to Trade and Industrial Education with Special Application to Alabama.* University of Alabama, 1935. 59 p.

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3438. SCHMIDT, FRED JULIUS, *Jr.* (Ed. D.). *The Evaluation of an Arts Workshop.* Indiana University, 1941. 327 p.

The purpose of this study was to determine whether the Burris Arts Workshop, Ball State Teachers College, Muncie, Indiana, developed in accordance with a particular philosophy and if it provided adequately for carrying out that philosophy. The study is limited to the procedures actually followed in the development of an arts workshop.

3439. SCHWEBKE, HOWARD J. *Analysis of Resource Units.* M. S., 1948, The Stout Institute, 85 p. Library, The Stout Institute, Menomonie, Wis.

Purpose: To make an analysis of the philosophies of resource units.

Source of Data: By means of a review of the curriculum suggestions submitted by the Wisconsin Co-operative Educational Planning Committee and a review of the literature by curriculum leaders, a check list was compiled. This check list was sent to Resource Committee Chairman of the Wisconsin Co-operative Educational Planning Committee for evaluation.

Findings and Conclusions: From the data compiled, the writer was able to rank in importance the materials to be included in the organization and content of a resource unit. These results were used to prepare: A definition of a resource unit, a check list for evaluating a resource unit, and a guide for the preparation of resource units. It is suggested that the Resource Committee Chairman of the Wisconsin Co-operative Educational Planning Committee consider the entire study. The appendices, which include the following: "The Analysis of a Resource Unit," "Check List for Evaluating a Resource Unit," "Guide for Preparation of Resource Units," and "Resource Units vs. Teaching Units," could be made available to teachers who prepare or use resource units.

3440. SELDEN, CHARLES W. *Frank Henry Selden, His Writings and Philosophy in the Field of Industrial Education.* M. A., 1944, University of Minnesota. 104 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To evaluate the work of Frank Selden in the field of industrial education.

Source of Data: Data were obtained by a survey of articles and books written by Mr. Selden.

Findings and Conclusions: Mr. Selden's work has had important effects on shop work of today and his work has had an influence on improvement in the field as a whole.

3441. SEYBOLD, GRANVILLE J. (Masters). *A Study of the Functional Relationships between the Objectives of Industrial Arts and General Education.* Ohio State University, 1936.

3442. SHELLEY, ROBERT JOSEPH (M. S.). *Industrial Arts as the Core Curriculum in the Rural Community High School.* University of Southern California, 1948. 28 p.

An analysis of the point of view that industrial arts as the core curriculum meets effectively the objectives of education in a rural school.

3443. SLAUGHTER, OTHA L. *Contribution of Industrial Arts To Life Adjustment Education In Carthage, Texas.* M. Ed., 1951, Agricultural and Mechanicail College of Texas. 57 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To summarize the philosophy of life adjustment education, to show the place of industrial arts in life adjustment education, to present methods and techniques in industrial arts necessary to meet life adjustment needs, and to evaluate the program in terms of life adjustment education.

Source of Data: Data were secured from books, bulletins, pamphlets, and periodical articles.

Findings and Conclusions: Every effort should be made to keep youth in high school. They need an enxtended program of education. The greatest contribution of industrial arts is that it trains youth to express themselves in nonverbal activities and to live more intelligently in our modern technological society.

3444. SMITH, EBER K. (Masters). *The Integration and Correlation of Industrial Arts With Academic Subjects.* Wayne University, 1946.

3445. SMITH, L. T. (Masters). *Industrial Arts in the Rural Community High School.* Western Kentucky State Teachers College, 1931.

3446. STEINER, RUSSEL QUENTIN (Masters). *A Study of Industrial Arts Education in the Consolidated Schools of Indiana.* University of Michigan, 1934.

3447. STEPHENSON, LEE (M. S.). *The General Shop as an Educational Activity in the Small High School.* Oregon State College, 1933. 74 p.

A study which supports the general shop concept for junior high school industrial arts. A suggested course of study and a description of the methods in vogue for setting up and operating a general shop are included.

3448. STUCKI, RALPH EMMETT (M. S.). *Proposed Standards for Industrial Arts in the Public Junior and Senior High Schools of Louisiana.* Louisiana State University, 1948. 129 p.

Presents a modern conception of industrial arts as secured from opinions of nationally known industrial arts leaders and as compared with the industrial arts program offered in Louisiana.

3449. TEMPLIN, ROY P. (Masters). *A Consideration of Three Phases of Industrial Education.* Boston University, 1930.

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3450. TILLEY, TRUMAN E. (Doctors). *Synthesis of Academic Work and Industrial Education as a Means of Improving General Education.* Northwestern University, 1945.

3451. TOMKINS, ALEX (Masters). *Determination of an Adequate Course of Industrial Arts for Ninth Grade in Terms of Child Needs, Psychological Possibilities and Social Needs.* North Texas State Teachers College, 1942.

3452. TREON, BYRON. *Relating Industrial Arts to the Total High School Program.* M. A. E., 1952, University of Florida. 118 p. Library, University of Florida, Gainesville.

Purpose: To review the basic philosophy of industrial arts and to show how it may be integrated into the Junior High School program.

Source of Data: Data were secured from professional books and periodicals, observation, and visitation in selected junior high schools in the Tampa, Florida area.

Findings and Conclusions: An increasing number of public junior and senior high schools are offering industrial arts as a means of attracting, holding, and servicing youth.

3453. WAITE, ROBERT BABCOCK (Masters). *Possibilities for Vocational Training through Courses in Industrial Arts.* Ohio State University, 1937.

3454. WALKER, ERNEST E. (M. S.). *The Place of Industrial Arts in the Junior High School.* Oklahoma A & M College, 1940. 139 p.

An analysis of educational principles and industrial arts objectives, pointing out the place of industrial arts in general education. Literature written over a ten year period (1930–1940) was studied to determine the value and place of industrial arts in the junior high school.

3455. WEATHERFORD, MARION T. (M. S.). *Metalcraft as an Educational Medium in the Industrial Arts Program.* Oregon State College, 1938. 106 p.

Presents the ideas and opinions of educators with reference to the educative value of metalcraft as a medium of instruction in industrial arts. An evaluation of metalcraft in comparison with other industrial arts media is made.

3456. WILLIAMS, WALTER R. (Masters). *Pottery in the Secondary Schools: With Special Reference to the Laboratory Problems and Resulting Appreciations.* Ohio State University, 1933.

3457. WILLIAMSON, SCOTT (Masters). *The Aims of Manual Arts as Developed in Texas.* Southern Methodist University, 1934.

3458. WILSON, LAWRENCE E. (Masters). *A Program of Interpretation for the Industrial Arts.* University of Nebraska, 1936.

3459. WINEGARDEN, DAVID R. (Masters). *Industrial Arts Objectives.* Butler University, 1940.

3460. WISE, GLENN ORION (Masters). *Methods of Interpreting the Industrial Arts.* Iowa State College, 1939.

3461. WRIGHT, ROLLIFF A. (M. A.). *The Existing Aims of Printing in the Junior and Senior High Schools of the United States.* Colorado State College of Education, 1936. 110 p.

An analysis and evaluation of existing aims of printing offered in the secondary schools.

3462. YOUMANS, CHARLES O. (Masters). *Functionality of Industrial Arts.* Ohio State University, 1937.

Social Adjustment and Trends

3463. CAMPISI, JOSEPH JAMES. *Social Adjustment of Industrial Arts Students, A Comparative Study of Students Electing Industrial Arts and the Academic Course of Study.* M. A., 1951, The Ohio State University. 75 p. Library, The Ohio State University, Columbus.

Purpose: To learn how well industrial arts students are adjusted socially and the contributions of industrial arts to their social adjustment.

Source of Data: The study involved two matched groups of students. One group elected industrial arts and the other the academic course. Adjustment tests were given to each group at the start of the school year and again at the end of the year. The results were compared for significant differences.

Findings and Conclusions: There were no great differences between the two groups; both groups were well adjusted at the beginning of the school year, and neither group changed in adjustment in the final testing. The industrial arts student at Chaney High School is as well adjusted as the academic student, and industrial arts contributes no more to social adjustment than academic courses.

3464. FAULKNER, FLOYD CHARLES (M. A.). *The Place of Social Studies in a Program of Vocational Education on the Secondary School Level.* University of Maryland, 1944. 59 p.

A study of the social studies curricula in vocational schools. It synthesizes and organizes previous works in the field of social studies pertaining to vocational education and proposes an outline for the social studies in vocational schools.

3465. FORTNER, JAMES T. (Masters). *The Correlation of General Shop With Fifth and Sixth Grade Social Sciences.* University of Southern California, 1931.

3466. HAMILTON, C. MERRILL (Masters). *Inventions and Their Socio-economic Influences; a Study of Content for Industrial Arts.* Ohio State University, 1944.

3467. HUNT, NILE F. *An Analysis of Certain Social-Economic Factors in North Carolina With Implications for an Improved Program of General Education Including Industrial Arts.* M. S., 1950, North Carolina State College. 101 p. Library, North Carolina State College, Raleigh.

Purpose: To determine the implications of the social-economic factors in North Carolina to curriculum making for an improved program of general education including industrial arts based upon a modern educational philosopsy.

Source of Data: A study was made of data presented in the U. S. Census Reports, economic and sociological studies and various publications by Federal and State agencies.

Findings and Conclusions: **A program of education construed as a life adjustment process must have its identity in the ongoing life of the people. Analysis of significant social-economic factors surrounding the life of the people of North Carolina reveals manifold implications for education. The planning of an educational program which is commensurate with the needs can best be accomplished by advantageous utilization of the possibilities that the social-industrial concept of industrial arts affords. Its intimate relation with industry and technology along with its attention to the personal, social, and economic problems of living related thereto, enables industrial arts to bring to a program of general education a direct and effective means of acquiring a life relationship.**

3468. KLEIN, MAX R. (Masters). ***Social-Economic Trends and Their Influence upon the Industrial Arts Curriculum.*** **Ohio State University, 1935.**

3469. McCAIN, WILLIAM MORTON. (M.A.). ***The School Shop and Community Forces—The Affects of Social Interaction Upon the Development of the School Shop Program of One Pennsylvania City.*** **University of Maryland, 1948. 96 p.**

An historical study of the social, economic, political, and educational forces which have affected the development of school shop programs in a Pennsylvania city beginning with the Colonial period. The report suggests that educators consider these forces in the future development of educational programs.

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3470. OLSEN, EDWARD G. (Ed. D.). ***Social Economics for Industrial Workers.*** **Columbia University, 1937.**

The preparation and description of a study guide adapted to the needs of the publicity supported trade and industrial training classes already existing in the state of Ohio.

3471. SHEPPARD, ANNAMAY TOPKINS. ***A Course of Study in Industrial and Labor Relations For Pupils in the Vocational High Schools of New York State.*** **M. S., 1949, Cornell University. 125 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: **To develop a course of study in industrial and labor relations which would be useful in the curricula of New York State vocational high schools as a part of the social studies program.**

Source of Data: **Survey of literature. The social studies and allied fields was systematically surveyed.**

Findings and Conclusions: **The outline of content of the proposed course in industrial labor relations includes: Worker, employer, and community, historical background of modern industrial and labor relations, New York State legislation, modern industrial and labor relations, human relations in industry, and problems and issues in industrial and labor relations.**

Types of Programs

Adult Education—Trade Extension—Out-of-School Youth

3472. BAILEY, CAROL D. ***Training for Coal Miners in Cooperation with the Public Schools of Tennessee.*** **M. S., 1952, University of Tennessee. 50 p. Library, University of Tennessee, Knoxville.**

Purpose: **To ascertain the extent to which the public schools of Tennessee are participating in the training of coal miners, and to offer suggestions for improving present programs in this area.**

Source of Data: **Data were secured from records, official files, annual reports, personal conferences with state and local administrators, supervisors, and by means of questionnaires.**

Findings and Conclusions: **Reimbursable evening trade extension classes for coal miners were conducted by public schools from 1925 to 1952. Classes were conducted in 17 counties with a total enrollment of 18,258. Course offerings have expanded to 20 units. The program, under the direction of the Coordinator of mining extension classes, has been rendering real service as evidenced by continuous demand for classes, and the approval of industrial employers as well as workers in the communities served.**

3473. BARDONNER, NELLO E. (M. S.). ***An Analysis of the Interest, Needs, and Activities of the Students of the Waukegan Township Evening School***

at Waukegan, Ill. Iowa State College, 1932. 54 p.

A brief history of the Waukegan Township Evening School. Pertinent data concern age distribution of pupils, nationality, scholastic attainments, reasons for discontinuing formal education, activities of pupils, and length of attendance.

3474. **BARNETT, EDWARD B.** *A Survey to Determine What Adult Needs May be Met by the Industrial Arts Department of the Public Schools of Kansas.* M. S., 1952, Kansas State Teachers College. 41 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the status of the industrial arts program for adults in the public high schools of Kansas, and to make suggestions that may add to the value of the program.

Source of Data: Data were obtained from available literature in the field of adult education and questionnaires sent to public school administrators.

Findings and Conclusions: The demand for adult education activities in order of popularity are: vocational training, avocational or hobby classes, and cultural-social programs. Industrial arts departments are especially well qualified to meet the avocational-hobby needs of adults. Industrial arts departments may well be used to present the broad basic skills and the related information to workmen who are engaged in specialized jobs in fields requiring low skill or semi-skill.

3475. **BARRY, RICHARD V.** (Masters). *Methods of Teaching in Evening Industrial Schools.* Boston College, 1931.

3476. **BEACH, CHARLES KENNETH** (M. S.). *A Study of the Personal Characteristics, Training and Interests of People Attending Adult Classes under the Emergency Education Program in Oregon.* Oregon State College, 1936. 64 p.

An investigation of the personal characteristics of adult students, their educational training and background, and their personal interests and activities during their leisure time. Length of and kind of classes most desired, attitude of students toward adult education, and personal characteristics indicated the direction adult education should follow.

3477. **BERTRAM, CARL G.** (M. A.). *Itinerant Instruction in Wisconsin—A State Plan of Offering Instruction to Trade and Industrial Groups.* University of Minnesota, 1932. 155 p.

A descriptive analysis of the development and practices of itinerant instruction in Wisconsin, based on an investigation of materials on state and national levels. A plan to broaden the vocational offerings in scattered schools and in industrial groups is included.

3478. **BRENNEMAN, ROY H.** (M. A.). *Industrial Arts in the Civilian Conservation Corps.* Ohio State University, 1940. 117 p.

A study of the CCC, with particular attention to the nature and value of industrial arts courses offered. Technical training, recreational arts and crafts, techniques of instruction, and equipment aspects of the program are investigated.

3479. **BUESS, CHARLEY M.** *Adult Education in the High School Industrial Arts Shop.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 47 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To determine the ability of the average Kansas high school shop to increase its offerings; the qualification of the industrial arts teachers to participate in adult education; and the adaptability of the high school shop to adult education programs.

Source of Data: Survey of Class A high schools of Kansas and interviews.

Findings and Conclusions: The high school appears to be the logical place for adult programs. Existing facilities are adequate and the instructional staff have broad training. Thirty-seven courses are listed which have proven successful in Kansas. Additional types of courses are proposed.

3480. **BUTLER, LEMMIE R.** (M. S.). *Desirable Content of the Industrial Arts Course For the London Oil Company.* A & M College of Texas, 1936. 56 p.

Investigates the educational background and educational needs of employees in two oil companies as revealed by company records and judgments of plant superintendents, with the view of adapting course content to needs.

3481. **CHINNOCK, DWIGHT D.** *Problems in the Setting-Up of An Evening*

Extension Program in a City of Approximately 25,000 Population. M. A., University of Minnesota, 1941. 68 p.

A study outlining background, objectives, organization, administration, and supervision of evening extension programs of industrial and distributive education.

3482. CLAUSEN, DOUGLAS W. (Masters). *A Study of the Methods, Media, and Technique used in Interpreting Vocational and Adult Education in Wisconsin.* University of Wisconsin, 1940.

3483. DALE, ROBERT B. *An Analysis of the Evening School Drop-Outs at the Aero Mechanics Vocational High School.* M. Ed., 1954, Wayne University. 34 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To identify the reasons for students in the evening school program not completing their courses.

Source of Data: Data were obtained from professional pamphlets, periodicals, books, interviews, and a questionnaire.

Findings and Conclusions: The following were found to be the major reasons for drop-outs: lack of necessary training prior to enrollment; the training program is considerably longer than the student anticipated; and the inability of the student to apply the training toward suitable employment.

3484. DAVOLI, RAYMOND MARTIN. *The Trade and Industrial Evening Instructor in Minnesota.* M. A., 1954, University of Minnesota. 57 p. Industrial Education Department, University of Minnesota, Minneapolis.

Purpose: To collect and make available specific information relative to important aspects of the part-time trade and evening trade extension instructors in Minnesota.

Source of Data: Data were obtained by interviews and questions sent to local directors of vocational education, supervisors, coordinators, and evening instructors in nine area vocational schools in Minnesota.

Findings and Conclusions: The evening trade extension instructor in Minnesota was found to have an above-average education in addition to having many years of experience in his trade.

3485. DILL, LOWELL P. (M.S.). *Industrial Pursuits of Employed Negroes in the Major Industries of Bessemer, Alabama, as Related to an Adult Vocational Training Program.* Colorado Agricultural & Mechanical College, 1936. 106 p.

A study of the development of a vocational program to fit the needs of Negroes employed in the major industries of Bessemer, Alabama. A survey of the major industries to determine the training needs and to evaluate the present program is the basis of the study.

3486. DYKE, DELBERT A. (Masters). *A Trade Extension Vocational Education Program for Engine Lathe Operators.* Oklahoma A & M College, 1941.

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3487. FLAHERTY, HUGH (Ed. D.). *Training War Workers for the Aircraft Industry.* New York University School of Education, 1944.

A study of a traditional vocational department of a high school and the influence of a war training program on the curriculum. It considers the aims and objectives of vocational education.

3488. FUNK, E. H. (M.S.). *A Curriculum Plan in Sheet Metal Pattern Drafting for an Adult Trade Extension Group in Watertown, Wisconsin.* The Stout Institute, 1941. 68 p.

An analytical survey of tradesmen, shop superintendents, and shop managers in Watertown, Wisconsin, to determine the need for a trade extension program in sheet metal pattern drafting. A course of study is included.

3489. FUNKEY, LYMAN H. (M.S.). *Industrial Training for Fresh Water Commercial Fishermen.* Colorado Agricultural & Mechanical College, 1941. 125 p.

A report of the duties and responsibilities of workers in fresh water commercial fisheries and the type of training need. A suggested unit of instruction for the training of commercial fishermen in vocational schools is included.

3490. GERBER, CHARLOTTE BUSBY (M.S.). *A Study of the Los Angeles Training School for Household Em-*

ployees. University of Southern California, 1940. 128 p.

A study presenting methods of operation of the Los Angeles Center for Household Employees. It includes evidence of effectiveness of the training and discloses the need for such training.

3491. GROSSE, MARIO A. (Masters). *Unit Course of Study for the Training of Shipwrights.* Stanford University, 1945.

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3492. HANEY, PHILIP HELLER. *The Need for Vocational Training in the Baking Industries of Essex County.* Ed. D., 1949, Rutgers University. 337 p. Library, Rutgers University, New Brunswick, N. J.

Purpose: To discover whether there was a need for vocational training in the baking industries of Essex County. To suggest the nature of the training program if such training is advisable.

Source of Data: Interview of 300 representatives of the baking industry of Essex County, Federal Departments and bureaus, trade associations, training institutions, and individuals who have been active in the baking phase of the vocational field.

Findings and Conclusions: Economic conditions through large-scale operation and increasing number of baking establishment failures suggest the advisability of establishing training programs for workers in the baking industry. Local education authorities are interested in establishing training programs for the baking industry, but need the help of the industry to formulate plans. Workers employed in the baking industry are interested in being provided with an opportunity to obtain training in the specific phases of the baking industry. A majority of the persons interviewed favor: a trade preparatory course that requires three years for completion, a course which would admit persons between 15 and 16 years of age, a comprehensive course that will include instruction in all phases of the baker's occupation, and the use of instructors who have had practical experience in the field of baking.

3493. HENNING, ROBERT T. (M. S.). *Values Derived From Industrial Arts By 120 Male Adults.* Iowa State College, 1934. 40 p.

An investigation of 120 men in one industrial and one nonindustrial city to determine the values to be obtained from studying industrial arts.

3494. HIGHLEN, C. E. (M. Ed). *Training Needs for Hotel and Restaurant Workers.* Colorado Agricultural & Mechanical College, 1948. 154 p.

A study of the units of vocational training needed for workers in the hotel and restaurant fields in Atlantic City, New Jersey.

3495. HOLMES, FORREST A. (M. Ed.). *Pre-Service Instruction Training for Tradesmen Employed to Teach Evening Extension Classes.* Colorado Agricultural & Mechanical College, 1944. 87 p.

A study of the training of skilled tradesmen. Included are such items as time devoted to training, content of instruction, teacher training methods, and pay for teacher trainees. A plan for a pre-service teacher-training program is offered.

3496. HUNT, P B. (Masters). *The National Defense Training Opportunities for Negro Men and Women in Philadelphia, Montgomery, Delaware and Bucks Counties.* University of Pennsylvania, c. 1935–47.

3497. HURST, LINCOLN WALKER. *Developing an Adult Education Program for a New Community.* M. Ed., University of Cincinnati, 1941. 89 p.

A history of the development of an adult education program in a new, experimental, government-owned community.

3498. JACKMAN, DUANE. *Workers' Education.* M. A., University of Minnesota, 1947. 125 p.

This study shows the importance of workers' education, the effect of World War II, and the responsibilities of public schools. Trends were noted since 1941 showing a shift in emphasis and an increase in membership.

3499. KENNEDY, ROBERT EARL (M. S.). *Needs and Possibilities of a Program of Adult Vocational Education in Tennessee.* University of Tennessee, 1935. 120 p.

The development of the vocational phase of adult education in Tennessee and an analysis of the needs for the expansion of company training programs through which the workers of Tennessee may be better fitted to meet the demands of industry.

3500. KEYES, WALTER E. *A Research Analysis of Student Holding Power* *in Evening School Classes.* M. Sc., Colorado Agricultural and Mechanical College, 1932. 96 p.

A study of the holding power of evening school teachers and an analysis of the factors involved.

3501. **KIMBALL, EARL H.** *Developing an Adult Evening School Program for Waterloo, Iowa.* M. Ed., Colorado Agricultural and Mechanical College, 1948.

An attempt to determine the need for an adult education program by analyzing the population data obtained from the 1940 census and by obtaining information from adults in the community.

3502. **KISSINGER, J. H. (M. S.).** *A Study of the Electrical Jobs Performed in the Home by the Average Householder: A Survey Directed toward the Formulation of an Appropriate Course of Study in Electricity for an Adult Education Program in Evening Schools.* Pennsylvania State College, 1947. 68 p.

A study to determine what electrical jobs are performed and what electrical information is required in the average home. It points up the electrical jobs performed most often by the average householder.

3503. **LANIER, ENSELL BAKER.** *Industrial Arts Classes for Adults in Louisiana.* M. S., 1954, Louisiana State University. 115 p. Library, Louisiana State University, Baton Rouge.

Purpose: To analyze the possibility and need for a more comprehensive adult training program in the industrial arts shops of Louisiana.

Source of Data: Data were obtained from questionnaires sent to industrial arts teachers in the state, and were tabulated according to participation, organization, and combination of adult programs.

Findings and Conclusions: The adult shop program contributes to the welfare of any community. Facilities are adequate for such a program in Louisiana. The responsibility for organizing the program as a community service lies with the instructor. The use of the industrial arts shops for an adult program should be considered when new school shops are planned and constructed.

3504. **MOREHEAD, NATHANIEL SYLVESTER.** *A Study of Industrial Vocational Education for Negro Adults in Guilford and Forsyth Counties, North Carolina.* M. S., 1951, Agricultural and Technical College of North Carolina. 71 p. Library, Agricultural and Technical College of North Carolina, Greensboro.

Purpose: To ascertain the status of vocational-industrial education programs for Negro adults in Guilford and Forsyth Counties, North Carolina, with special reference to quality and extent of training now being provided.

Source of Data: Data were secured through questionnaire, letters, and visitation.

Findings and Conclusions: Most of the Negro adult classes had clearly stated objectives; laboratory facilities were rated good in general; and instructional methods were very flexible. More written material in all classes was needed. Most teachers met both experience and educational training requirements. Guidance was neglected.

3505. **MUNSON, SAMUEL NILES.** *An Evening School Program for Men Employed in the Building Trades.* M. Ed., 1950, Colorado Agricultural and Mechanical College. 77 p. Library, Colorado, Agricultural and Mechanical College, Fort Collins.

Purpose: To determine subject matter suitable for course content for journeymen workers in the following building trades: Carpentry, electricity, masonry, millmen (cabinet making), painting and decorating, sheetmetal and steamfitting.

Source of Data: The area covered in this study was limited to 6 cities in the Fox River Valley area in eastern Wisconsin. They are: Appleton, Fond du lac, Green Bay, Manitowoc, Oshkosh, and Sheboygan. The time period covered in the research was the latter part of 1949 and the first 6 months of 1950. Sources of data were literature and a check sheet distributed to journeymen in the building trades.

Findings and Conclusions: Courses be prepared and established that will cover the blocks revealed. The best results from this type of program would probably be obtained in a system that was not too large.

3506. **MURRAY, LEWIS L.** *A Survey of Adult Avocational Industrial Arts Programs in Public Schools of Northwest Ohio.* M. S., 1953, Bowling

Green State University. 60 p. Library, Bowling Green State University, Bowling Green, Ohio.

Purpose: To learn how avocational industrial arts programs are administered and supervised; to discover what influence evening programs have on in-school day industrial arts programs; to ascertain methods and procedures of class instruction employed by teachers; and to discover reasons why adults are interested in such programs.

Source of Data: Data were secured by questionnaire, interview, visits to classes in session, and literature on adult education.

Findings and Conclusions: The responsibility for the administration and supervision of the program varied. Class offerings conformed to student demand. It was reported by the instructors that industrial arts was better interpreted to the community as a result of the adult program. Individual instruction was the principal method used. The majority of the adults enrolled in the evening classes to learn to use tools and to work with construction materials.

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3507. NAGLE, ROLAND FRANK. *Status and Opinions of Adult Education in the Public Schools of Missouri.* Ed. D., 1952, University of Missouri. 218 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the status of adult education in the public schools of Missouri and to obtain opinions and attitudes of adults toward this phase of education.

Source of Data: Data concerning the status of adult education were obtained from the State Department of Education, Jefferson City, Missouri, and by means of information forms. Data concerning the adult students and their opinions and attitudes were obtained from information forms completed by 1,112 adults participating in adult education at time of study.

Findings and Conclusions: Adult education classes are offered by the public schools in towns and cities of nearly all sizes throughout the state. Reimbursable classes represent approximately three-fourths of the total enrollment; however, more growth has taken place in non-reimbursable classes in recent years. As many adults in out-state Missouri attend adult education classes as do adults in Kansas City or greater St. Louis. Persons representing every type and level of work and a wide range of ages attend adult classes. The greatest number fall in the 21 to 35 age group and are more advanced in years of schooling than the total adult population of the state. Men are more apt to enroll in adult classes for occupational reasons, while women are more apt to enroll in courses for self improvement and leisure time activity. Adults are about evenly divided as to whether they should pay all expenses of the adult program or rely on some public aid in addition to student fees. Adults are unfavorable to the idea of local taxation for adult education; however, their attitudes toward the use of state funds are most favorable.

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3508. NICHOLSON, DAVID HULL (Ed. D.). *Why Adults Attend School—An Analysis of Motivating Factors.* University of Missouri, 1948. 259 p.

An extensive and detailed study of the reasons why adults attend school, analyzed in terms of age, sex, occupational choice, educational background, economic, marital, and veteran status. Needed improvements in adult education programs are suggested.

3509. OATLOW, JOHN R. (Masters). *The Selection of Adjustment and Service Jobs for a Car-Owner Repair Course in Auto Mechanics.* University of Nebraska, 1930.

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3510. OSBURN, BURL NEFF (Ph. D.). *Adult Education in Handicrafts in the United States.* Ohio State University, 1939. 286 p.

An historical study of handicrafts in America. From historical documents, social work organizations, and interviews, data is gathered to point up the many values which may be attributed to this subject.

3511. PATTERSON, ARTHUR K. (M. S.), *A Study to Determine How the School and the Community Can Better Help the Industrial Wage Earner in Williamsport, Pennsylvania.* Pennsylvania State College, 1931. 84 p.

A survey to determine the workers' needs, the available school facilities, and the community facilities available to meet these needs. Conclusions and recommendations have been reached showing how these needs might be met.

3512. PENDLETON, JOHN H. (Masters). *Industrial Arts as a Factor in Adult Education.* Iowa State College, 1940.

3513. PERKINS, M. H. *Industrial Arts Content for the Adult Home Craftsman.* **M. S., Iowa State College, 1939. 65 p.**

A general study was made of some of the leading magazines on shop work and craft work to discover what types of projects were offered for craftsmen.

3514. PORTER, HAROLD WM. (M. S.). *A Training Program for Adults in the Worthy Use of Leisure Time.* **Colorado Agricultural & Mechanical College, 1939. 112 p.**

A study on the development of a leisure time program. A training program based on interests and activities is devised for adults over eighteen.

3515. POWELL, GLENN RICHARD. *Adult Utilization of Information Obtained and Skills Developed in High School Industrial Arts Courses.* **M. A., 1952, The State College of Washington. 40 p. Library, State College of Washington, Pullman.**

Purposes: To discover what aspects of industrial arts training are being used most by adults in Whitman County and what types of industrial arts instruction are judged most important for their children.

Source of Data: Data were secured by interviews.

Findings and Conclusions: While there is little evidence that industrial arts contributed directly in preparing the adults for their vocations, there is evidence to show that what they learned in the industrial arts program is of general educational value.

3516. POWERS, MASTON LINZIE (Masters). *Blue-print Reading and Sketching for the Petroleum Worker.* **Oklahoma A. & M. College, 1939.**

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3517. PRICE, DENNIS HENRY. *An analysis of Current Practices in the Evening Trade Extension Classes in the Largest Ten Cities in Each of Five Midwestern States.* **Ed. D., 1955, Indiana University. 219 p. Library, Indiana University, Bloomington.**

Purpose: To ascertain current practices existing in the evening trade extension program.

Source of Data: Data were secured through an interview schedule from ten cities in Illinois, Indiana, Kentucky, Michigan, and Ohio.

Findings and Conclusions: Considerable variations in duties and responsibilities of administrators and supervisors were noted. The most used promotional device was feature news items in local newspapers. Certification of instructors was a state responsibility and little variation appeared. Their selection and training was a responsibility of local supervisors. Instructors were selected primarily for experience in the trades to be taught rather than academic preparation. Educational background of instructors selected from the day-trade group were more extensixe than journeymen instructors. Limited use was made of general advisory and craft committees. The lecture was found to be most useful for the related technical classes, whereas, individual instruction was most used in shop and laboratory classes.

3518. RITZMAN, H. C. (M. S.). *A Program of Trade Extension and Apprenticeship Training in Sheet Metal in Superior, Wisconsin.* **The Stout Institute, 1940. 90 p.**

A survey of the extension training requirements and the sheet metal shop owners in Superior, Wisconsin, to determine the reasons for the absence of skilled sheet metal workers in Superior, Wisconsin in 1940.

3519. SARCHETT, ALVIE MILO. *Techniques for Promoting, Administering and Evaluating an Adult Education Program in a Community College.* **M. S., 1950, Iowa State College. 77 p. Library, Iowa State College, Ames.**

Purpose: To set forth fundamental principles that can be used as a guide for other communities setting up an adult education program.

Source of Data: A descriptive record of plans which have been found desirable in one city in the development of an adult education program in a community college.

Findings and Conclusions: In organizing an adult education program for a community college, the following principles should be considered: The adults of the community should be made familiar with possibilities of adult education; the program should come from the adults of the community; the program should meet the needs and desires of the adults of the community; a plan must be set up to administer the program; the program should be evaluated in order to determine how well the adult education program is functioning.

3520. SCANLON, ANABEL MARY. *Problems of Women in Industry in World War II.* **M. A., 1948, Catholic University. 85 p. Library, Catholic University, Washington, D. C.**

Purpose: To study the problems involved in the education of women, management, and labor to the realization of the major role that women would have to play in the production of war materials.

Source of Data: The study reviews methods used in getting women into industry noting the obstacles presented by the attitude of women toward such work, the attitude of management toward their employment and the attitude of the male labor force toward the employment of women. Specific problems were considered such as: Wages and hours, absenteeism and quit rates, selection, placement, induction, training, supervision, counseling, health and safety measures. Data were obtained from general publications, and from studies and reports of selected companies.

Findings and Conclusions: Women were found to do an outstanding production job in various types of work with a minimum of training and in spite of traditional prejudice. The "equal pay for equal work" principle was supported by their performance. War-time conditions led to practices in the way of counseling, training, supervising, health and safety which will not be lost in post war industry.

3521. SCHUERMANN, WILLIAM O. *Proposed Program for Using The Composite General Shop For Adult Education.* M. S., 1953, Kansas State Teachers College. 40 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To survey the outcomes of a composite general shop program for adults in Lamar, Missouri.

Source of Data: Data were obtained from a questionnaire, records, interviews, and examinations of literature in the field.

Findings and Conclusions: The composite general shop is well-adapted for teaching adults. Adult skills are developed, new home workshops created, knowledge of tools and equipment for those who had shops increased, and community-school relationship improved.

3522. SMITH, RAY PALMER. *Study of Adult Education in Cleveland To Determine Whether Facts Found by this Study Should Influence the Industrial Arts Program.* M. A., Kent State University, 1941.

A study to show the far-reaching influence of adult education on industrial arts.

3523. SPENCE, JOHN ALLEN. *A Study of Adult Industrial Arts Programs in the Public Schools of Ohio.* M. A., 1952, The Ohio State University. 124 p. Library, The Ohio State University, Columbus.

Purpose: To identify common objectives of the program; to establish accepted objectives and criteria by which to evaluate these programs in terms of the attainment of the accepted objectives; to make a general evaluation of a representative cross section of existing programs in Ohio in light of the criteria.

Source of Data: Data were obtained from questionnaires mailed to districts reported to be holding classes for adults, literature of industrial arts and adult education, and visits to programs.

Findings and Conclusions: A total of forty recommendations were offered for improvement of Ohio programs in regard to: guiding principles, organization, financing, offerings, facilities, instruction, evaluation, and outcomes.

3524. STEELY, THOMAS BRAZELTON (M. Ed.). *Adult Education in Texas.* University of Texas, 1939. 96 p.

A descriptive and historical study of adult education of less than college grade in Texas, with special reference to federally aided programs. Legislation, reports, and records from 1933 to 1939 are surveyed.

3525. STEVENS, WILLARD W. (M. S.). *Elimination from the Evening School Classes of the J. Sterling Morton Township High School at Cicero, Illinois.* Iowa State College, 1931. 66 p.

A comparison of the attendance records of the commercial and industrial arts groups from 1930 to 1931. Data are presented showing the percentage of pupils remaining to finish each of the several courses.

3526. TREAT, FRANK MORRIS (M. S.). *Training Methods in Mechanical Coal Mining.* Colorado Agricultural & Mechanical College, 1932. 122 p.

A description of the development of a method of selecting content and procedures for efficient training in coal mines undergoing transition from old mining practices to mechanical mining. Two courses of study are suggested, one for pre-employment in mechanized coal mining and one for the trade extension type of class.

3527. TURNER, ROBERT E. *Possible Contributions of Industrial Arts to Adult Education in St. Joseph, Missouri.* M. Ed., 1953, Colorado Agri-

cultural and Mechanical College. 80 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the ways and the extent to which industrial arts can serve adults in St. Joseph, Missouri

Source of Data: Data were secured from a survey of ten cities with populations of 75,000 or more, from a ten per cent random sampling of St. Joseeph adults, and from enrollment records in adult education in other Missouri cities.

Findings and Conclusions: There was an indicated need for avocational adult education in St. Joseph which could be served by the industrial arts department, where facilities were adequate to meet the need. Generally, women were mainly interested in activities related to the home and handicrafts; men were primarily interested in construction activities. Industrial arts activities which should be given first consideration in the avocational adult education program of St. Joseph are: upholstery, furniture refinishing, household mechanics, house planning, elementary electricity, home workshop problems, weaving, leathercraft, cabinetmaking, and machineshop.

3528. WALN, JAMES A. (M. S.). *Training Welders for National Defense.* Pennsylvania State College, 1942. 155 p.

An examination of the philosophies and practices which predominate for training welders in schools under the auspices of the Defense Training Division of the United States Office of Education. The problems met in setting up a nationwide program of this type are considered.

3529. WEAVER, HAROLD M. (Masters). *The Development of Terminal Courses in Mining in a California Junior College.* Stanford University, 1941.

3530. WHITEHEAD, NORMAN HALE (Masters). *An Outline Course of Study for a Manual Arts Evening High School.* Brown University, 1937. 82 p.

3531. WINES, LYLE G. (M. S.). *A Study of Aeronautical Information for the General Public.* The Stout Institute, 1942.

The development of a course of study in ground school subjects for adults desiring aeronautical information on an avocational level. Data are based on a survey of the students and faculty of the adult evening school at Fordson High School, Dearnborn, Michigan.

3532. WINTER, JR., ALBERT LOUIS. *A Program of Adult Industrial Arts For Screven County High School, Sylvania, Georgia.* M. of I. A., 1953, North Carolina State College. 34 p. Library, North Carolina State College, Raleigh.

Purpose: To find ways of improving the industrial arts adult classes in Screven County High School, Sylvania, Georgia.

Source of Data: Data were secured by interview with industrial arts teachers and a questionaire sent to a representative sample of the community.

Findings and Conclusions: An adult industrial arts program must be well planned in advance. The hour of 7:30 P. M. is the best time for classes to begin. Classes usually meet for two hours a night, two days a week. People living in town are more interested in adult programs than those in rural communities.

3533. WOODARD, FRED O. *A Program of Extension Training for Negroes Employed as Domestic Servants in Jackson, Mississippi.* M. Ed., Colorado Agricultural and Mechanical College, 1946.

A study of the possibilities of setting up a training program for Negro domestic servants in Jackson, Miss., with a suggested program offered.

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3534. WREN, HAROLD A. (Doctors). *Vocational Aspiration Levels of Adults.* Teachers College, Columbia University, 1941.

Apprenticeship

3535. ARTHUR, HARLAN RANDOLPH. *Industrial Apprenticeship Training.* M. Ed., 1953, Wayne University. 36 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To present the organizational structure and operational functions of the various groups involved in an industrial apprenticeship program in a major manufacturing industry.

Source of Data: Data were obtained from the records and files of the personnel and training departments of the company.

Findings and Conclusions: The company believes that apprenticeship training has proved to be more practical in maintaining a supply of skilled workmen than any other plan. Apprenticeship programs in new trades will be required as industry goes into the "push-button" factory age. Management is inclined toward more careful selection and placement of apprentices; greater use is being made of tests and personal interviews. The scope and content of related instruction has been improved. More attention has been given to the qualifications of apprentice training personnel.

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3536. AXELROD, AARON. *A Course of Study in Applied Science for Machine-Shop Apprentices.* Ed. D., 1951, New York University. 355 p. Library, New York University, New York.

Purpose: To develop a course of study in applied science which will be directly related to the usual jobs performed by apprentices in machine shops during their term of apprenticeship.

Source of Data: Data were secured through trade analyses of the machine shop trade in use in apprentice training institutions and the analysis of these for their science implications in the fields of chemistry, physics, and metallurgy.

Findings and Conclusions: A course of study was developed that can provide a definite program of science instruction as related to machine shop procedures.

3537. BARNES, EDWIN (Masters). *Suggested Content for Student Apprentices in General Electrical Work.* Oklahoma A. & M. College, 1939.

3538. BARNETT, EDWARD LEE (M.A.). *Fundamentals of Trade Education Designing and Drafting in the Education of the Apprentice.* State University of Iowa, 1940. 53 p.

A study considering the problem of apprenticeship as a whole, with particular emphasis on the interrelated problem of designing and drafting as part of apprentice training, with suggestions bearing on the ultimate solution of these inter-related problems.

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3539. BERGVIN, PAUL EMILE (Ed.D.). *An Evaluation of Corporation-Independent and Public School-Corporation Co-operative Apprentice Schools.* Indiana University, 1945. 186 p.

A study which attempts to develop a set of standards which may be used to evaluate apprentice training programs. These standards were derived from the literature on apprenticeship and from interviews and correspondence with directors of apprenticeship throughout the United States.

3540. CAMPAIGNE, GEORGE EDWARD. *An Occupational Survey of Twenty-Four Trades in Duluth, Minnesota.* M. A., University of Minnesota, 1948. 63 p.

A survey of the needs of industries, and of vocational education in the schools of Duluth plus practices of inducting boys into apprenticeship in the trades concerned.

3541. CHUBB, OLIVER. *Course in Non-Technical Problems for Apprentices in Kenosha, Wisconsin.* M. Ed., 1949, Colorado Agricultural and Mechanical College. 51 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To prepare a course in the nontechnical problems which arise when employed as an apprentice or journeyman in Kenosha, based on suggestions by the apprentices and a group of journeymen; 1946 to 1949.

Source of Data: Sources of data were literature, apprentices and journeymen employed in Kenosha. The problems considered in this study were first suggested by individual apprentices and then evaluated as to importance by all apprentices and the group of journeymen.

Findings and Conclusions: Many problems, other than technical craft problems confront craftsmen and apprentices. The school can be of service to the apprentice by giving instruction pertaining to certain of these problems.

3542. CLARK, VERGIL B. *Apprentice Training in Tennessee in Cooperation with the Public Schools.* M. S., 1952, University of Tennessee. 95 p. Library, University of Tennessee, Knoxville.

Purpose: To examine and evaluate apprentice training programs operating in Tennessee in cooperation with the public schools.

Source of Data: Data were secured by questionnaire.

Findings and Conclusions: Thirteen apprentice training programs were operating in twenty-one trades at the time of the study. Electricity, carpentry, and plumbing ranked in this order in enrollment. It is recommended that a comprehensive study be made of apprentice training in Tennessee. The most vexing and difficult problem is that of providing classes for scattered apprentices in non-industrial localities.

3543. DIETRICH, ARNOLD JOHN (M. Ed.). *The Need for Pattern-Making Apprentices in the Milwaukee, Wisconsin Area.* Colorado Agricultural & Mechanical College, 1946.

A survey of the need for pattern-making apprentices in the Milwaukee area. Union, apprentice, journeyman, and industry viewpoints are discussed.

3544. DURYEE, DEO V. *A Manual for Apprentice Teachers and Coordinators in the State of Michigan,* M.A., University of Michigan, 1943. 150 p.

An historical background leading to present day apprenticeship in the U. S. and more specifically in Michigan. Procedures to establish a program, indenturing, and model courses of study.

3545. EWING, CLAUDE HENRY (M. A.). *A Measure of the Efficiency and the Deficiency of the Training of Painting and Decorating Apprentices.* Colorado Agricultural & Mechanical College, 1936. 86 p.

A survey of the one hundred graduates of the Washburne Continuation and Apprentice School, Chicago, to determine the value of the School's training program for painting and decorating apprentices. Improvements in the program are suggested.

3546. FEIERABEND, HARVEY J. *The St. Paul Sheet-Metal-Working Apprentice Training Program.* M. A., 1950, University of Minnesota. 57 p. Department of Industrial Education, University of Minnesota, Duluth.

Purpose: To examine the development and operation of a sound program of apprenticeship in a skilled trade.

Source of Data: Actual observation of apprentice training activities.

Findings and Conclusions: Men with long experience on apprenticeship committees have furnished the needed enthusiasm and stability to keep the program functioning continuously and smoothly. Careful selection of apprentices has resulted in nearly zero "turnovers" or "quits."

3547. FREUND, RAYMOND J. *On-the-Job Training.* M. A., University of Minnesota, 1948. 218 p.

A study of on-the-job training and apprenticeship, including different on-the-job training procedures.

3548. GEIGER, H. EUGENE (M. S.). *Apprentices' Attitudes Toward Their Training and the Construction of a Diagnostic Scale.* Purdue University, 1937. 67 p.

Two equivalent attitudes scales were constructed according to the Thurstone equal appearing intervals technique. The scales were administered to 227 apprentices, and correlations were computed.

3549. GISRIEL, AUSTIN E. *The Serviceman's Readjustment Act of 1944: On-the-Job Training and Apprenticeship Program in Maryland.* M. A., 1951, University of Maryland. 113 p. Library, University of Maryland, College Park.

Purpose: To present information about the Servicemen's Readjustment Act of 1944 relative to on-the-job training and the apprenticeship program in Maryland.

Source of Data: Data were obtained from the State Department of Education,, Baltimore Regional Office of the Veteran's Administration, unpublished directives issued by State Approving Agency, and the writer's experience in the training of veterans.

Findings and Conclusions: Many amendments were made to the Serviceman's Readjustment Act of 1944. Much more deliberation should be given to the details of administration of any future program. No provisions were made for progressive study and evaluation of the effects of the Veteran's Training Program. The administration of any federal program of this nature should be on the local level.

3550. GRAF, MAX G. (M. A.). *Qualities and Skills Central Missouri Employers Seek When Employing Apprentices.* Colorado State College of Education, 1938. 55 p.

An investigation presenting the qualities and skills needed by employees of Central Missouri, as determined by the employers.

3551. GREEN, J. R. (Masters). *A Compilation of Analyses of Trades Common to Oklahoma That Lend Themselves to Apprentice Training.* Oklahoma A. & M. College, 1935.

3552. HAMBROOK, ROBERT (Masters). *Methods Used in Preparation of United States Government Bulletin on Light Frame House Construction, Technical Information for the Use of Apprentices and Journeyman Carpenter.* George Washington University, 1930.

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3553. HAMMER, GARLAND G. *The Relation Of Trade And Industrial School Education To Apprenticeship Training.* Ed. D., 1951, University of Missouri. 260 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the existing and desired relations of trade and industrial school education to apprenticeship training.

Source of Data: Data for the study were secured through inquiry forms sent to educators and to representatives of management and labor who were working with apprenticeship training and trade and industrial school education. From the tabulated data, a comparison of the opinions of these three groups was made.

Findings and Conclusions: There is need for better selection of apprentices based on interest, ability, previous training, and work experience. Although apprenticeship may have been more successful in training workers for the skilled trades than the day-trade school, there is definite need for pre-employment trade training to lay a foundation for apprenticeship and to serve non-apprentiable occupations. A definite number of hours of related instruction, varying with the trade, should be required of apprentices. Such instruction should be better organized and more closely related to on-the-job training. Better supervision of related instruction is needed, and this should be done by public school personnel. There is general agreement on the qualifications of instructors, supervisors and administrators of apprenticeship training. A need exists for a more positive attitude toward apprenticeship training. State apprenticeship counsels tend to improve apprenticeship training and should be encouraged. Both the state departments of labor and education should act in an advisory capacity concerning apprenticeship training.

3554. HANSEN, ARTHUR A. (Masters). *The Development and Organization of Related Subject Matter for Apprentices in the Machinist Trade.* University of Michigan, 1941.

3555. HANSON, DURWIN M. *Apprenticeship and On-the-Job Training Program in Iowa.* M. S., 1949, Iowa State College. 56 p. Library, Iowa State College, Ames.

Purpose: To ascertain status and distribution of on-the-job and apprenticeship training programs in Iowa construction, manufacturing and service trades.

Source of Data: Survey of 2,926 establishments approved to train in the following jobs: Bricklayer, carpenter, electrician, glazier, printer, plasterer, plumber, patternmaker, photo-engraver, refrigeration repair, upholsterer, watchmaker.

Findings and Conclusions: In general 3 out of every 5 training programs were of the on-the-job classification with the largest percentage distribution of apprentice programs being concentrated in cities over 10,000 population. The study reveals the distribution of all programs by counties and by size (population) of community. Of the total of 2,926 training establishments surveyed, 1,138 were classified in the construction trade group, 403 in manufacturing trade group and 1,385 in the service trade group. The data recorded reveals the following information: Location of training establishments; job title for which training was approved; length of training programs; beginning training wage; and after-training on journeyman wage.

3556. HEIN, WILBERT R. *A Survey of Related Work for Machinist Apprentices.* M. S., 1951, Stout State College. 63 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain to what extent the fundamental operations, as related to machine shop, are being demonstrated to apprentices, and the evaluations placed on these operations by teachers in the field.

Source of Data: Data were obtained by survey of literature in the field, and a check list and questionnaire sent to the teachers in Wisconsin vocational and adult schools.

Findings and Conclusions: The activities of teachers in the field have been analyzed and placed in an order of rated importance for the convenience of new teachers interested in apprenticeship problems. The order of preference of the list of demonstrations must be revised continually to adapt it to the varying conditions of training.

3557. HODGSON, JACK O. (M. S.). *How Many Carpenter Apprentices Should be in Training in the Lincoln Area?* Colorado Agricultural & Mechanical College, 1941. 71 p.

An investigation of the amount of building that has been done in the Lincoln, Illinois, area, 1935–1940, the number of carpenters employed, and union regulations and contractor's ideas. Recommendations are made for the need for more apprentices.

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3558. HOSLER, FRED W. (Ed. D.). *The Administrative Organization for the Apprenticeship Learnership Program in the Panama Canal Zone.* Teachers College, Columbia University, 1938. 180 p.

The study deals with the background and setting up of an apprenticeship and learnership program in the Panama Canal Zone, the need for the training program, changes in the secondary school curriculum which were necessary in order that the schools could serve the Zone better, the organization and administration of the apprentice-learner school, and recommendations for the future.

3559. JAKEMAN, ARTHUR E. (M. A.). *The Development of an Apprentice Training Program for the Skilled Trades in a Small Repair Shipyard.* West Virginia University, 1939. 90 p.

An analytical description of the program for apprentice training at the Norfolk, Virginia shipyards to point up the need of collaboration of work and related technical subjects.

3560. JENKINS, WESLEY E. (Masters). *A Study of Apprenticeship in the English Woodworking Guilds.* Ohio State University, 1934.

3561. JEWSON, FRANK B. (M. S.). *Apprenticeship and Trade Extension Training—A Plan of Procedure for Promotion With Specific Application to Superior, Wisconsin.* The Stout Institute, 1939. 222 p.

A study of the organization and development of the trade and apprenticeship training program of the state vocational school of superior, Wisconsin. A discussion of the organization and function of the advisory committee system used in Superior is included.

3562. KASEY, MYRON. *Apprenticeship Training in the Detroit Automotive Industry.* M. Ed., 1955, Wayne University. 45 p. Department of Industrial Education, Wayne University, Detroit, Michigan.

Purpose: To become acquainted with the programs and to report some of the skills employed by the automotive companies in the building of tools and equipment.

Source of Data: Data were obtained from books, periodicals, professional pamphlets, and interviews with men in government and industrial positions.

Findings and Conclusions: The Federal Bureau of Apprenticeship, Michigan State Department of Vocational Education, the UAW-CIO International Union, the Board of Education, and the training departments of the automotive companies have an active part in apprentice training. Apprentice programs may differ in contents and hours with each company, but basically they are the same.

3563. KEINHOLZ, WILLIAM SIMS (M. A.). *A Partial Study of Apprenticeship in the United States.* University of Southern California, 1931. 173 p.

A study of certain selected aprenticeship programs in the United States, including their growth and development and present status.

3564. KREUGER, MARVIN L. *An Analysis of Apprentice Enrollments in Wisconsin Schools of Vocational and Adult Education, 1927–1953.* M. S., 1954, Stout State College. 66 p. Library, Stout State College, Menomonie, Wis.

Purpose: To secure and analyze data concerned with Wisconsin apprentice enrollments.

Source of Data: Data were obtained from a review of literature and records of Wisconsin State Board Vocational and Adult Education.

Findings and Conclusions: There is no uniform relationship between the number of apprentice enrollments in the city vocational schools of Wisconsin and the populations of those cities in which the schools are located or between the apprentice enrollments in Wisconsin vocational schools and the number of individuals employed in non-agricultural occupations. There has been no steady increase of apprentice enrollments in Wisconsin vocational schools from 1927–1953.

3565. LUFF, ANDREW CHARLES. *A Recommended Program of Related Instruction for Electrical Apprentices.* M. A. 1950, University of Michigan. 117 p. Library, University of Michigan, Ann Arbor.

Purpose: To present a program of related instruction to be incorporated with the established program for electrical apprenticeship in the Kalamazoo, Michigan area.

Source of Data: Data were secured from descriptive brochures and outlines of sample programs furnished by the U. S. Department of Labor, labor unions, various corporations, and interviews with leading contractors and union representatives in the Kalamazoo area.

Findings and Conclusions: It is believed that this program is unique in its use of the complete facilities of a technical institution for the presentation of material. It is possible that the program herein outlined may serve as a guide to other communities faced with similar problems.

3566. **MacKENZIE, THOMAS THEODORE** (M. S.). *A Plan for Apprenticeship Training in the City of Santa Barbara, California.* Oregon State College, 1940.

A study of the desirability, methods, and laws affecting the training of apprentices in Santa Barbara, California.

3567. **MAEDER, FREDERICK OTTO.** (M. S.). *Plumbing Apprenticeship and its Relation to Itinerant Instruction in Thirteen Wisconsin Cities for Years 1925 to 1930.* Colorado Agricultural & Mechanical College, 1933. 84 p.

A statistical analysis of the number of apprentice plumbers required by each of thirteen cities in Wisconsin.

3568. **MATCHETT, EDWARD JOHNSTON** (M. A.). *An Analysis of the Wisconsin Apprentice System.* State University of Iowa, 1943. 55 p.

An analysis of Wisconsin apprenticeship law, historical background, relationship between the state apprenticeship program and the state program of vocational and adult education, and description of a plan inaugurated by the State Industrial Commission for the effective operation of the provisions of the law.

3569. **McDILL, WILLIAM A.** (M. Ed.). *Apprenticeship in Canada and the Northern Border States.* Colorado Agricultural & Mechanical College, 1948. 663 p.

A comparison of apprenticeship training in Canada and the northern border states of the United States. Topics such as apprenticeship legislation and government plans, regulations, and standards are considered.

3570. **MILLER, MILTON EVANS** (M. S.). *The Apprentice Training Program of the United States Naval Gun Factory, Washington, District of Columbia.* University of Tennessee, 1947. 123 p.

A study of the training organizations, policies and regulations governing apprentice training, curriculum of the apprentice school, and shop training for apprentice school, and shop training for apprentices of the Naval Gun Factory in Washington, D. C. A history of the United States Navy Yard and gun factory from 1799 to 1947 is included.

3571. **MOSES, MORGAN C.** *American Apprenticeship and Its Contribution to Industrial Arts.* M. S., 1950, North Texas State College. 88 p. Library, North Texas State College, Denton.

Purpose: To show, through the development of American apprenticeship, certain factors and influences that have contributed to the growth of industrial arts in the public schools of the United States.

Source of Data: Data for the study were collected from books, articles, documentary bulletins, published and unpublished Government material, and from industrial publications.

Findings and Conclusions: Industrial arts, with general objectives patterned after apprenticeship principles, is a vital stepping stone in the present day efforts to train better tradesmen and more skilled craftsmen through apprenticeship.

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3572. **MOSS, LOUIS QUENTIN** (Ed. D.). *The project Method Applied to Curriculum Construction in the Apprentice Schools of United States Navy Yards.* Temple University, 1938, 157 p.

An historical study of the development of apprentice training and related instruction in U. S. Navy Yards. Twelve criteria for the development of project curricula in related subjects of apprentice training were submitted for opinion to 118 experts.

3573. **MYERS, WALLACE K.** *A study of Trade Education and Apprentice Training in the United States With Special Reference to Certain Corporation Training Programs.* M. S., 1950, North Texas State College. 92 p.

Library, North Texas State College, Denton.

Purpose: To trace the apprentice training program in the United States with special reference to certain corporation training programs.

Source of Data: Data for the study were secured from books, periodicals, public documents of the U. S. Government, the Texas Veterans agency and other literature on trade education provided by labor unions and corporations.

Findings and Conclusions: Apprentice training in the United States was patterned after the old English system. Labor organizations want a program of training skilled craftsmen. One of management's most valued assets is its skilled workmen. Certain leading companies have initiated training programs of their own. It should be the task of labor and management to organize and maintain training programs.

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3574. NIEMELA, ALBERT WESTON. *Industrial Apprenticeship in Contra Costa County, California.* Ed. D., 1949, Stanford University. 207 p. Cubberley Library, Stanford University, Palo Alto, Calif.

Purpose: To investigate the apprentice training program in Contra Costa County from the point of view of the guidance worker.

Source of Data: The history of apprenticeship was studied with implications for the way it affects present apprenticeship programs. Apprenticeship standards in the various trades on a national basis were studied and compared with those of Contra Costa County. Some personal interviews were employed.

Findings and Conclusions: Counselors should be thoroughly informed about the opportunities open to high school graduates through the avenue of industrial apprenticeship. Careers in skilled trades should become an integral part of the occupational information program. Educators should make a reappraisal of the place of the preapprentice training programs in the high schools.

3575. NORBERTA, Sister (Masters). *A Comparative Study of the Medevial Apprenticeship System and the Modern Trade School System in the United States.* University of Notre Dame, 1939.

3576. PICKREL, LEON F. (M. A.). *Fundamentals of Trade Education Apprenticeship in the Metals Trade.* State University of Iowa, 1939. 58 p.

A study of and suggested curriculum for apprentice training of two classes of skilled workers in the metal trades—toolmakers and patternmakers.

3577. PODRAS, JOHN FRED. *A Survey of the Development and the Selection of Related Instructional Materials for Apprentices.* M. S., 1950, Purdue University. 78 p. Library, Purdue University, Lafayette, Ind.

Purpose: To find the types of teaching and the efficiency of each as carried on by apprentice instructors in 5 selected cities in Indiana.

Source of Data: The materials of instruction were gathered from each city and interviews and observations held with all instructors of apprentices in the city.

Findings and Conclusions: City Number 1—Material was developed locally; City Number 2—based on a formal trade analysis; City Number 3—individual instruction sheets were developed by teachers; City Number 4—individual instruction sheets were used as developed by an informal curriculum committee; City Number 5—material was developed locally but is non-organized. The teacher uses texts as the need may arise.

3578. ROSANDER, WILLIAM ARTHUR. *A Study of the Instructional Program for the Related Subjects Instruction of Carpentry Apprentices.* M. S., 1954, Purdue University. 20 p. Library, Purdue University, Lafayette, Ind.

Purpose: To ascertain the practices and opinions of related subjects, instructors of carpentry apprentices with reference to subject matter, performance, social and economic areas, testing, attendance, and records.

Source of Data: Data were obtained through questionnaires from 26 carpenters and instructors of carpentry apprentices in the states of Indiana, Ohio, and Michigan.

Findings and Conclusions: There was a wide difference between actual practices of instructors and what they believed to be desired, particularly in the performance area. The survey indicated a significant difference of opinion between instructors and tradesmen regarding subject matter in social and civic areas, type of skills and amount of time spent in practicing these skills and the requirements the apprentice should meet. In all programs studied some type of testing was being provided and some type of records were kept.

3579. ROSECRANS, GEORGE L. *Factors Affecting the Attendance of Ap-*

prentices at Technical Courses. M. A., 1950, University of California at Berkeley. 107 p. Lange Library, Haviland Hall, University of California, Berkeley.

Purpose: To determine and evaluate some of the factors which contribute to or detract from good attendance at the apprentice classes. To recommend measures which will increase attendance at apprentice classes.

Source of Data: Personal interviews and questionnaires were used in compiling the data for this study.

Findings and Conclusions: Influences affecting attendance were found to be (in order of importance): Greatest influence on apprentice attendance is encouragement of journeymen with whom he works: Second greatest influence is sufficient books; interest; insistence upon class attendance by employers; interest in class attendance by employers; grade school completed by the apprentice and the term of related instruction completed in the apprenticeship program did not appear to be significant with respect to attendance; class attendance is seldom discouraged by journeymen; and length of teaching experience of the teacher has little effect on attendance.

3580. ROSS, O. O. (M. A.). *The Vocational Needs of Youth.* Colorado State College of Education, 1937. 188 p.

A study of apprenticeship training as a method of meeting the vocational needs of boys. Case studies and interviews of potential employers of Greeley, Colorado were the basis of the study.

3581. ROSSOW, CLARENCE H. (M. S.). *A Study of the Responsibilities of the Wisconsin Part-Time Schools Relative to the Provision for Extension Education for Apprentices.* Colorado Agricultural & Mechanical College, 1938. 120 p.

An investigation of the part-time school in Wisconsin and its function. Several course outlines are provided for apprentice training for mechanics.

3582. RUSS, CLARENCE AUSTIN. *A Study of Selected Corporation Apprenticeship Training Programs.* M. of I. Ed., 1953, North Carolina State College. 49 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the location of corporation apprenticeship programs available to North Carolina high school students, the types of training given in these programs, the qualifications required for apprentices, and the benefits of the apprenticeship programs.

Source of Data: Data were secured through questionnaires sent to the directors of twenty-six apprenticeship programs located in North Central, Northeastern and Southeastern States.

Findings and Conclusions: More than two-thirds of the apprenticeship programs covered in this study are available to North Carolina high school graduates. These programs operated by old and reliable corporations give enterprising young men the opportunity to receive valuable training in a wide variety of highly skilled trades.

3583. SPANGLER, ALBERT J. (Masters). *An Historical Accounting of the Preparation of Instructional Material Entitled Metallurgy for Machine Shop Apprentices.* University of Akron, 1943.

3584. ST. BLANC, FRANCIS CYRIL. *Status of Apprenticeships in Louisiana.* M. S., 1953, Louisiana State University. 102 p. Library, Louisiana State University, Baton Rouge.

Purpose: To trace the historical development of the apprenticeship system in Louisiana, and to inquire into the administrative policies regarding apprenticeship.

Source of Data: Data were obtained from the files of the Apprenticeship Division, State Department of Labor, and the Trade and Industrial Division of the Louisiana State Department of Education.

Findings and Conclusions: The large industrial enterprises are sharing the responsibility for the training of apprentices in skilled trades. The largest number of apprentices was in the building trades. Twenty-three state operated area trade schools served sixty-four parishes, and made available their service to all apprentices on a statewide basis.

3585. STINGLE, HOWARD E. (Masters.). *Development of a Program in Printing Composition for the Government Printing Office Apprentice School.* George Washington University, 1947.

3586. THOMAS, LOYAL P. (M. S.). *Comparative Selective Devices for Shipyard Apprentices.* University of Southern California, 1944. 194 p.

A study of selective factors used in connection with the pre-apprentice training program of the U. S. Naval drydocks, Terminal Island. It attempts to correlate all observable factors for the special group studied.

3587. **TREFZ, WILLIAM A. (M. S.).** *Selection of Instructional Material for Apprenticeship and Trade Extension Training.* The Stout Institute, 1947. 158 p.

On the basis of expressed needs of workers at the Manitowac, Wisconsin, Shipbuilding Company, a course of study is developed for apprenticeship and trade extension training for machinist workers of the company.

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3588. **VAN DUSEN, EDWARD B. (Ph. D.).** *Apprenticeship in Western New York State—A Study of the Development and Present Status of Apprentice Training Programs, and of Indentured Apprentices.* Cornell University, 1948. 464 p. Published: New York State School of Industrial and Labor Relations, 1949.

A study of apprentices and apprenticeship in western New York State, examining the historical background of apprenticeship, the organizational structure of apprenticeship, and the apprentices themselves. Much current information relative to the status of apprenticeship in the area studied is given in the summary of the data collected from the apprentices by quesionnaire.

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3589. **VAN OOT, BENJAMIN HENRY (Ph. D.).** *The Optimum Qualifications for Apprenticeship in Certain Allied Trades.* Columbia University, 1932. 38 p. Published: *Apprentice Training for Shipyard Trades* (Bulletin No. 160, T. and I. Series, No. 46), Federal Board of Vocational Education, 1932.

A description of an educational and training program, based on data compiled over a three year period, in an effort to discover the factors which contribute to success in apprenticeship in the shipbuilding industry.

3590. **VOLL, WALTER CARL (Masters).** *Apprentice Training in Industry.* Teachers College, Columbia University, 1935. 74 p.

3591. **WHIFFEN, U. GLENN.** *Training Course in Boiler Repair for Railroad Apprentices.* M. S., Iowa State College, 1930. 117 p.

The purpose of this study was to give operation and information sheets with the proper procedure for boiler-maker apprentices in railway locomotive shops.

Continuation

3592. **BOWMAN, RANSOM PAT (Masters).** *A General Shop Program for the Tulsa Part-Time Continuation School.* Oklahoma A. & M. College, 1936.

3593. **DALTON, FRANCIS WARREN.** *A Survey of the Part-Time Continuation Schools in Four Michigan Cities.* M. A., University of Michigan, 1931. 60 p.

The development and need for part-time education, the status of the schools, its potentialities as to service, and a record as to the employment activities of the part-time students are presented together with reference to some national aspects of compulsory part-time education.

3594. **FOSTER, ORLAND A.** *Human Relations for Part-Time Students.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 188 p.

A compilation of material about human relations secured from books, bulletins, and conferences with supervisors and coordinators for presentation to part-time high school students.

3595. **FRANZ, ANNE H. (Masters).** *A Study of a Group of Boys Enrolled in Part-Time Vocational Training in Robert E. Lee High School, Jacksonville, Florida.* University of Florida, 1944.

3596. **JONES, BILLY TRUMAN (M. Ed.).** *The Part-Time Trade and Industrial School.* University of Texas, 1937. 116 p.

A survey of the development of the part-time trade and industrial school as it operates under the Smith-Hughes Act, with comments on its purposes and values.

3597. REGAN, WILLIAM J. (M. Ed.). *Present Day Demands on Continuation Schools.* University of Buffalo, 1935. 127 p.

An historical study of the development of continuation schools including the purpose and selection of curricular content. It contains case studies of fifty students in the school system.

3598. SCHANZER, RAYMOND J. (M. Ed.). *An Analysis of 160 Buffalo Continuation School Boys in the Distributive Trades.* University of Buffalo, 1941. 93 p.

n analysis of the intelligence, school accomplishment, and job success of 160 pupils of a continuation school. Problems in teaching methods, curriculum, administration, and pupil personnel are considered.

3599. SHELLY, COSLIN R. (M. Ed.). *The Status of the Continuation School in Pennsylvania.* Temple University, 1934. 107 p.

A survey of continuation school teachers and their superintendents and supervising principals in 1932 to determine the extent of continuation school training and personnel factors concerning the faculties.

3600. STAUFFACHER, EARL M. (M. A.). *A Study of the Full-Time Trade and Part-Time Continuation Pupils in the George Junior Trade School.* Wayne University, 1936. 181 p.

A survey of the source, background, needs, interests, ambitions, attitudes, attendance, and residence of all pupils at this Detroit school from 1931–32 to 1933–34 inclusive. The organization of the school is evaluated and recommendations are made.

3601. THOMAS, HELEN LEONA (M. A.). *The Occupational Training of High School Pupils.* University of New Mexico, 1939. 80 p.

A study of the need of part-time occupational training for the communities of Aztec and Farmington, New Mexico. The organization for a proposed program is discussed.

Cooperative

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3602. ARNOLD, FRANK J. (Ph. D.). *Is Vocational Co-operative Work in New York City Schools a Success or a Failure?* New York University School of Education, 1932.

An evaluation of the co-operative educational plan in New York City (1915 through 1932) in an effort to determine the extension of such programs and the attitude of the school authorities regarding the programs.

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3603. BILLINGS, DONN. *Industrial Co-operative Education and Training for New York State High Schools.* Ed. D., 1953, New York University. 327 p. Library, New York University, New York.

Purpose: To investigate the cooperative programs for the purpose of formulating a comprehensive statement of recommended practices for particular application to training in industrial occupations through New York State high schools.

Source of Data: Data were secured through a questionnaire, correspondence, and educational bulletins from thirty-eight selected states. Observations and interviews were conducted in thirteen states. Developments in New York State derived from data reported annually concerning program operation from 1949 to 1952.

Findings and Conclusions: Results of the study are indicated in 208 itemized recommendations for use in New York State. The recommendations are classified under program organization and development and program operation and conduct.

3604. BORNHOEFT, MARTIN H. *The Advantages of Cooperative Vocational Training.* M. Ed., 1947, Wayne University. 26 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To examine co-operative vocational education including definition, objectives, and advantages to the community, the school system, the student, and industry.

Source of Data: Data were obtained from books and bulletins.

Findings and Conclusions: Cooperative vocational education is expanding. It has the advantage that school plants do not lie idle for three months of the year, thus reducing the cost per month of education. The cost of maintaining modern machines is borne by industry and training is on the machines which industry uses. Students learn about work in industry, thus motivating their school work.

3605. CAFFERTY, DONALD L. *Part-Time Cooperative Training at Stillwater.* M. A., University of Minnesota, 1945. 99 p.

Facts and plans to aid in the establishment and administration of a special cooperative vocational training program for certain high school seniors.

3606. DANIEL, JULIAN TURK (Masters). *Co-operative Vocational Education.* University of Wisconsin, 1938.

3607. DOLLEY, ROBERT D. (M. S.). *A Program of Co-operative Vocational Education for Jacksonville, Florida.* Colorado Agricultural & Mechanical College, 1934. 131 p.

A plan for a program of co-operative education providing a variety of vocational training for senior high school students. The plan is especially designed to fit a community with limited funds.

3608. EDMONSON, DON CHASE. *Employers' Opinions of Certain Work Habits and Attitudes of Student Workers in the Cooperative Occupational Training Program in the St. Clair River Area.* M. A., 1951, University of Michigan. 50 p. Library, University of Michigan, Ann Arbor.

Purpose: To secure employers' estimates of their student workers under the Cooperative Occupational Training Program in terms of habits of work and attitudes toward work, and to ascertain whether there was a group of students, in terms of age and school grade level, that tended to meet the requirements for competent workers more satisfactorily than others.

Source of Data: Data were obtained by interview with sixty-two employers employing Cooperative Occupational Training students.

Findings and Conclusions: Students were rated high in matters pertaining to their employers' business and also rated very high in honesty in their dealings with their fellow workers. In the employers' opinions, most of the students were eager to learn better ways of doing their jobs and were also happy and friendly workers. The common criticism that student workers today show little respect for supervisors, was not true of the majority of the students included in this inquiry. The study justifies the conclusion that students in the second year of the program were more successful than the first year students in meeting high requirements in their work habits and in their relationships with associates.

3609. GOINS, JOE CLYDE. *The Part-Time Cooperative Program in Diversified Occupations in Campbell County, Tennessee.* M. S., 1949, Universiyt of Tennessee. 97 p. Library, University of Tennessee, Knoxville.

Purpose: To determine to what extent the part-time diversified cooperative program, covering the period 1938 through 1948, has been valuable to the school, the community, and to the student-learner.

Source of Data: Data were secured from questionnaires submitted by students who were enrolled or had been enrolled in the program; school principals, school files, and statements from training agencies.

Findings and Conclusions: In the 4 years previous to the diversified occupations program, 54 percent of the high school graduates immediately after completion of high school, were entering some type of occupation. Out of a total enrollment of 256; 85 of the graduates and 29 of the non-graduates entered full-time employment as a result of the diversified occupations training. Of those who entered full-time employment 69 percent remained in the local community. Those who plan *not* to enter college receive more benefit from the program than those who plan to enter college. The program provides an opportunity for the students to earn some money. An average of $255.64 per student per year was made. It has a definite place in high school. The training agencies state that the program is serving the community and should be continued.

3610. HANSELMAN, WALTER FERDINAND (M. S.). *A Part-Time Co-operative Plan for Training Workers of the Skilled Trades of the Metal Industry of Chicago.* Colorado Agricultural & Mechanical College, 1937. 123 p.

An investigation of the desirability and feasability of a part-time co-operative program for Chicago high schools in connection with industry for the purpose of training skilled workers in the metal trades industry. A plan for the school system is formulated.

3611. HODGES, WILLIAM WALTER. *The Feasibility of Adding the Cooperative Part-Time Occupations Program to an Industrial Education Program in Winchester, Indiana.*

M. Ed., 1952, Colorado Agricultural and Mechanical College. 70 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the need for and feasibility of a diversified occupations program for Winchester, Indiana.

Source of Data: Data were secured through interviews, questionnaires, and observations.

Findings and Conclusions: School officials of Winchester High School favored adding the D. O. program. Business and industrial people were willing to cooperate. Students wanted the program. There is a need for continuation of the present trade and industrial offerings.

3612. HORTON, ERNEST BOYD, (M. S.). *The Part-time Co-operative Program in Diversified Occupations at Humboldt (Tennessee) High School.* University of Tennessee, 1948. 70 p.

A survey of former students of the Humboldt diversified occupations program, 1941 to 1946, to determine the value of the training. Questions on the number of years of training for the present job, wages or salary, and employment record since leaving high school were asked.

3613. MARSHALL, ROBERT C. (M. S.). *A Type of Co-operative Vocational Education—Jacksonville, Florida.* Syracuse University, 1934. 88 p.

A description of the co-operative part-time vocational progarm in Jacksonville, Florida. The events that led to its inauguration are considered and an evaluation of the program is presented.

3614. McGOWAN, CLARENCE ROY. *Need for a Cooperative Vocational Program for Negro Youth in San Antonio, Texas.* M. S., 1950, Iowa State College. 45 p. Library, Iowa State College, Ames.

Purpose: None reported.

Source of Data: Personal interviews of employers in 151 establishments that employ Negroes on jobs that require 2,000 or more hours of training, during the year 1949.

Findings and Conclusions: A need exists for a cooperative vocational program for Negro youth in San Antonio, Texas. The employers interviewed stated that they would cooperate in such a training program.

3615. MIGLIO, JOSEPH PHILLIP. *A Description and Analysis of a Co-operative School and Industry Program for Training Machine-Tool Operators.* M. A., 1954, University of Minnesota. 106 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To describe and analyze a program for training machine-tool operators in and for industry.

Source of Data: Data were obtained from the Beloit Vocational and Adult School and Beloit Iron Works training records.

Findings and Conclusions: The cooperative training plan has achieved its purpose in providing machine-tool operators for the Beloit Iron Works. The majority of the men who completed the training program are capable of assuming all-round machinist responsibilities if given the opportunity.

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3616. MONROE, LYNNE C. (Ed. D.). *The Present Status of Co-operative Education in America.* University of Missouri, 1939. 214 p.

A study presenting factual data concerning background, development, and status of co-operative education in secondary schools and junior and senior colleges of the United States up to 1939.

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3617. OHLSON, ELI E. (Ed. D.). *A Comparison of the Success of Co-Operative and Non-Co-Operative Vocational High School Electrical Students in Employment.* University of Pittsburgh, 1943.

A study of the value of co-operative education and of whether work experience interferes with attaining nonvocational ideals in after school life.

3618. PARKER, FRED H. (M. S.). *Need for a Co-operative Vocational Program for Negro Youth in Tulsa Oklahoma.* Iowa State College, 1944. 55 p.

An investigation of Tulsa business establishments to discover if employers would co-operate in a part-time vocational program in the high schools for Negroes. Topics include employment, training, occupational levels, labor turnover, and the age of the Negro worker.

3619. SCHNUTH, RAYMOND L. ***A Cooperative Study of Part-Time Cooperative Programs in Minnesota.*** **M. A., 1950, University of Minnesota. 95 p. Department of Industrial Education, University of Minnesota, Duluth.**

Purpose: **To assist in the establishment of a cooperative part-time program for high school youth in the province of Saskatchewan, Canada.**

Source of Data: **Questionnaires were sent to coordinators and principals in cities where such programs exist. The literature was canvassed but was found to be limited as to usefulness.**

Findings and Conclusions: **Procedure recommended was to become familiar with the purpose of a program, determine training opportunities, set a general plan, create advisory committees, detail the plan, and find proper training locations.**

3620. SHENTON, JAMES E. ***Student Reaction to the Cooperative Program at the New York State Institute of Applied Arts and Sciences, Buffalo.*** **M. S. in Ed., 1950, Cornell University. 65 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: **To determine how successful the cooperative training program had been in the first year of operation.**

Source of Data: **One hundred and sixty-nine student questionnaires containing 4 questions in addition to personal interviews with respective department heads provided the basis for the study.**

Findings and Conclusions: **The cooperative form of education is very worthwhile. The first year of operation at the Buffalo Institute was carried out with a certain degree of success. Several intangible benefits resulted to the student such as gaining of self-confidence; being taught to assume some responsibility; and learning to get along with fellow workers. Four recommendations were made: A better follow-up of students on the cooperative job should be provided. The employer should be thoroughly informed of what is expected of him when he accepts a student trainee. A better orientation of the student is needed with respect to the cooperative program. The "earning aspects" of this type of education should be emphasized.**

3621. WALDHAUSER, DAMON W. (M. A.). ***Employment Relations of Students in a Cooperative Part-Time Class.*** **Colorado Agricultural & Mechanical College, 1940. 152 p.**

A survey of employers and students in Craig, Colorado, to discover problems that could be overcome in a class in employment relations. Possible solutions are offered for seventeen kinds of employee problems, twenty-three kinds of employee-employer problems, eight kinds of employee-fellow-employee problems, and six kinds of customer problems.

3622. WICKES, GERTRUDE (M. A.). ***A Proposed Plan for Co-Operation Education on the Secondary School Level.*** **University of California at Los Angeles, 1941.**

A suggested program to use the facilities of the schools in rehabilitating the unemployable groups of unskilled and semi-skilled workers, producing at the same time marketable goods from surplus commodities.

Correctional Institution

3623. BOEGLER, ROBERT HERMAN. ***The Organization of General Woodworking Shops in Selected Correctional Institutions of Michigan.*** **M. Ed., 1955, Wayne University. 28 p. Industrial Education Department, Wayne University, Detroit, Mich.**

Purpose: **To report existing industrial education programs in selected correctional institutions of Michigan with emphasis on the organization of the general woodworking shop.**

Source of Data: **Data were obtained through personal interviews at county, private, and state institutions.**

Findings and Conclusions: **Recommendations are made for longer commitments of boys at Boys Republic and Boys Vocational School. One month orientation courses for general woodworking shop in the use of basic tools and machines should be provided. A complete building program is recommended for the treatment and cure of delinquent boys at all three institutions.**

3624. BRUMBALOW, TED WINFIELD (M. A.). ***An Analysis of the Educational Program of the State Juvenile Training School, Gatesville, Texas.*** **University of Texas, 1938. 78 p.**

A survey of the vocational training available in a state school for delinquents, in terms of the abilities, interests, and needs of the boys. Personnel data, scholastic and vocational records of about eight hundred boys in the training school, and the institution's records and curricula are examined.

3625. FREEMAN, PHILIP Q. (Masters). *Vocational Survey for Sloan Industrial School, Bellefontaine, Ohio.* Ohio State University, 1930.

3626. HEPLER, EARL R. *The Trade and Vocational Training Program At The Kansas Industrial Reformatory At Hutchinson, Kansas.* M. S., 1954, Kansas State Teachers College. 134 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To ascertain the extent of trade and vocational training in the rehabilitation program at the Kansas State Industrial Reformatory at Hutchinson, Kansas.

Source of Data: Data were obtained from institutional records, interviews with officials, literature and case studies of inmates.

Findings and Conclusions: Forty-four per cent of inmates were unemployed at the time of their offence, and forty-six percent were common laborers. Preparation for trade employment at the institution is only partial, and is incomplete, although progress is being made.

3627. HUEBNER, SAMUEL GEORGE (M. S.). *A Survey of the Boys' Industrial School, Topeka, Kansas.* Kansas State Teachers College, Emporia, 1937. 84 p.

A description of the Boys' Industrial School in 1937. The adminstration, program and campus are reviewed, and the educational levels and habits and activities of the students at the school are considered.

3628. McCANN, M. C. (M. S.). *A Study of Industrial and Vocational Methods Used in the Rehabilitation of Delinquent Boys in Certain Industrial Schools in the Middle West.* The Stout Institute, 1939. 126 p.

A survey, based on interviews with teachers and on a study of the records of industrial schools in Wisconsin, Illinois, Indiana, Ohio, and Michigan, to compare their vocational education programs with those of public schools. Salaries, education, and training of teachers in the two types of schools are compared.

3629. McGREW, G. E. (M. S. in Ed.). *Work-Experience Training Programs in Educational and Corrective Institutions.* Cornell University, 1948. (Published, Mimeographed Bulletin No. 1, New York State School of Industrial and Labor Relations, Cornell University, Ithaca, New York.)

3630. POE, DALE F. (M. A.). *A Study of the Industrial Schools of the United States (Correctional Institutions).* Ohio State University, 1931. 91 p.

An analytical study of the industrial schools of the United States for delinquent boys and girls for the school year 1929–30. The causes and number of commitments, housing, discipline, vocational training, follow-up, and the personnel involved are considered.

3631. RAMBO, ERNEST STEELE (M. S.). *A Study of Education in the Texas Prison System with Recommendations for Instruction in Industrial Schools.* A & M College of Texas, 1933. 64 p.

A survey of the status of industrial education in the prisons of Texas in 1933, with emphasis upon needs, teachers, and administrative requirements.

3632. RANDLE, EUGENE P. (Masters). *Functions of Mississippi Industrial and Training School.* Louisiana State University, 1937.

3633. RICHARDS, GEORGE H. (Masters). *The Status of Industrial Education in the Seven State Reform Schools for Boys in the Middle West.* Iowa State College, 1934.

3634. ROSENBERGER, RALPH J. (M. A.). *Earning Occupations of Reformatory Inmates—A study of 1,000 Men in Relation to Age, Education, Intelligence and Reading Interests.* University of Minnesota, 1936. 148 p.

A study based upon 1,000 case histories of inmates of the St. Cloud, Minnesota, Reformatory to determine the relationships between the former occupations of inmates and such factors as intelligence, education grade levels, age levels, reading interests, and reading abilities.

3635. THOMAS, ALICE EMMA (M. S.). *A Survey of the Girls' Industrial School, Beloit, Kansas.* Kansas State Teachers College, Emporia, 1934. 59 p.

A study of the Girls' Industrial School with a brief history of its work since its establishment in 1889, but with special emphasis on the control and administration of the school as of 1934. Suggestions for the improvement of its administration and curriculum are offered.

3636. VAN TRIES, ROBERT P. (M. S.). *Some Implications for Industrial Education Based upon the Background of Boys at the Minnesota State Training School.* Iowa State College, 1947. 49 p.

A study of the delinquents of the Minnesota State Training School for Boys to discover if there are any implications in the findings for industrial education.

Diversified

3637. ALBRIGHT, S. PAUL (M. S.). *A Survey to Determine a Training Program for Diversified Occupations in Cheyenne, Wyoming.* Colorado Agricultural & Mechanical College, 1937. 87 p.

A study of the training program needed for workers in diversified occupations. Twenty-five occupations are studied, and job specifications and course content are set up.

3638. ALLEN, ROBERT WILSON (M. A.). *The Diversified Occupations Program in Virginia.* University of Virginia, 1939.

A statistical study of the Diversified Occupations Program at South Boston, Virginia, from 1936 to 1939. The types of training offered and the follow-up of graduates present a means of appraising the program.

3639. ARMSTRONG, EDMUND CARMACK. *A Part-Time Cooperative Program in Diversified Occupations at Oak Ridge, Tennessee.* M. S., 1949, The University of Tennessee. 112 p. Library, University of Tennessee, Knoxville.

Purpose: To present a record of the part-time program in diversified occupations from 1944 through 1949; and to evaluate its effectiveness both as a vocational training program and as a part of the total education plan.

Source of Data: Data were secured from textbooks and periodicals, Government publications and pamphlets, personal interviews, diversified occupations department and Oak Ridge High School files, and questionnaires completed by 25 employers, 56 students and 77 former students (both graduates and nongraduates).

Findings and Conclusions: The enrollment has progressively increased from year to year. The ratio of boys to girls was 21 to 17; 84 boys and 68 girls. Of the 152 receiving training, 52 percent were employed in Distributive Occupations, 37.5 percent in Trade and Industrial occupations, and 10.5 percent in office occupations. Students worked an average of 26.6 hours per week and received an average of $0.52½ per hour. Students-learners expressed themselves as having received considerable value from the training. School administrators stated that the program meets certain needs that cannot be met by other courses. Of the 24 employers answering the question, 71 percent stated that it was a "considerable advantage" to their firm to employ Diversified Occupations student-learners as compared with part-time learners secured from other sources; 21 percent stated "some advantage" and 8 percent stated "little advantage."

3640. BLACK, JAMES E. (Masters). *The Part-Time Diversified Occupations Program in Tennessee from 1939 through 1942.* University of Tennessee, 1943.

3641. BOLLINGER, GLADYS KING. *A Diversified Occupations Training Program: Its Organization and Evaluation.* M. A., University of Maryland, 1946. 146 p.

The research describes the organization and development of a diversified occupations training program at Maryland Park High School, Seat Pleasant, Md. and covers the first two years of the operation of the program, 1944 to 1946. The study would be a valuable reference for anyone who is setting up a diversified occupations training program. The program is described operationally and the benefits are explained in terms of the students as regards their scholastic, social and economic development.

3642. BROOKS, BENJAMIN BLACKMON (M. Ed.). *The Diversified Co-operative Program on the Secondary Level.* Cornell University, 1947. 164 p.

A comprehensive study of diversified co-operative training programs as they have developed in the United States. The parts to be played by the various agencies and personalities involved are discussed. Administrative details, as well as curricula problems are treated. The author, on the basis of his findings, has developed a suggested plan for the operation of a Diversified Co-operative Training plan in New York State.

3643. BROWN, GLENNON C. (Masters). *The Part-Time Co-operative Program of Diversified Occupations in the High School of Greenville, Tennessee.* University of Tennessee, 1947.

3644. FUSTON, ELISE WHITE. *The Part-Time Cooperative Program in Diversified Occupations in Hume-Fogg Technical and Vocational High School, 1943–1944 to 1952–1953.* M. S., 1955, University of Tennessee. 132 p. Library, University of Tennessee, Knoxville.

Purpose: To trace the development of the part-time cooperative program of diversified occupations at the Hume-Fogg Technical and Vocational High School.

Source of Data: Data were secured by a questionnaire sent to graduates and a study of state and local records.

Findings and Conclusions: Ninety-four percent of the graduates reporting were employed in office work and eighty per cent were still in Tennessee. A high percentage of the graduates credit the program with providing initial employment and providing ability to advance. Forty-five per cent were influenced to remain in school and graduate.

3645. GAFFIN, LUKE M. *The Part-Time Cooperative Programs of Diversified Occupations and Distributive Education in White County High School, Sparta, Tennessee.* M. S., 1953, University of Tennessee. 133 p. Library, University of Tennessee, Knoxville.

Purpose: To evaluate the diversified occupations and distributive education programs in the White County High School, Sparta, Tennessee.

Source of Data: Data were secured from a recent evaluative study.

Finding and Conclusions: School authorities, students, parents, and employers agree that the programs were of sound value and fulfilled a needed service at White County High School.

3646. GIBBS, ALFRED L. *Coordinator's Guidance Activities in the Diversified Occupations Programs.* M. S., 1951, Oklahoma Agricultural and Mechanical College. 39 p. Department of Trade and Industrial Education, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To ascertain the importance coordinators attach to the various phases of guidance and methods they use in carrying out this responsibility.

Source of Data: Data were obtained through questionnaires sent to 28 coordinators in the state, and from various state publications on guidance.

Findings and Conclusions: Coordinators have a high regard for the part which guidance plays in their programs. The program lends itself to effective guidance service. Coordinators are usually well prepared for this phase of their work.

3647. GREEN, WILLIAM P. (M. Ed.). *Training Units in Diversified Occupations for Aiding the Students in Civic and Social Adjustments.* Colorado Agricultural & Mechanical College, 1947. 55 p.

A study of the need for developing in students an understanding of the working world. Lesson plans are prepared to help solve the problems confronting students in diversified occupations classes.

3648. JUDISH, FRANK L. (M. S.). *Practices in Teaching Related Material to a Diversified Occupation Class in North Carolina.* Iowa State College, 1941. 49 p.

An investigation of co-ordinators who had had from one to seven years' experience in teaching related material to a diversified-occupations class to determine the practices in teaching related material to a diversified occupations class in North Carolina.

3649. KEYES, THOMAS L. *The Part-Time Cooperative Program in Diversified Occupations in the Nashville City High Schools 1940 to 1949, In-*

clusive. M. S., 1950, The University of Tennessee. 132 p. Library, University of Tennessee, Knoxville.

Purpose: To review and to evaluate the operation of the part-time cooperative training in Diversified Occupations as it has been offered in the Nashville City Schools since 1940.

Source of Data: Extensive recourse was made to local, State and Federal records bearing on the programs. The most important data were secured from the return of questionnaires sent to 1,000 persons who took Diversified Occupations training between the Fall of 1940 and 1949.

Findings and Conclusions: Of the 635 returns of the questionnaire, 308 or 49 per cent of those answering stated that they had made entrance into full-time employment as a result of their training in Diversified Occupations. Five hundred and eighty-six or 92 per cent of those answering reported graduation from high school, while only 45 trainees, or 7 per cent, stated that they did not graduate. On the basis of the returns received, 85 per cent of those who took training have remained in the local community. Sixteen percent of those reporting indicated the training greatly helped them in their present jobs. Thirteen per cent reported some value; six per cent reported no value. On those who replied, 53 per cent have taken schooling beyond the completion of Diversified Occupations, 47 per cent either took no further training or made no report. The Diversified Occupations program has encouraged young people to seek employment in the home town. It has given the community assistance in meeting its own needs.

3650. LEA, JOHN BRADLEY. *General Related Subjects Units for a Cooperative Part-Time Program in Diversified Occupations.* M. S., University of Tennessee, 1947. 221 p.

A program of related subjects units and assignment sheets for diversified occupational courses.

3651. LEONARD, VIOLA A. (M. Ed.). *The Diversified Occupations Curriculum For the Stillwater High School Program.* Colorado Agricultural & Mechanical College, 1945. 153 p.

A study of the diversified occupations curriculum of the Stillwater High School with recommendations for solving problems concerning organization and administration.

3652. MADISON, BETTY E. (Masters). *The Job of a Related Study in a Diversified Cooperative Training Program.* University of Florida, 1944.

3653. MANLEY, GEORGE E. (M. S.). *Content and Organization of Related Instruction For a Diversified Occupations Program.* Colorado Agricultural & Mechanical College, 1938. 379 p.

An investigation of the content, organization, and teaching devices needed for adequate, specific related instruction in the diversified occupations program for Opelika, Alabama. Fourteen occupations were studied, a job analysis was made for each, and teaching procedures were discussed.

3654. MATHIS, QUINCE EDWARD. *A Survey of Practices in Teaching General Related Subjects to Students Enrolled in Diversified Occupations in Selected Communities in the Southern Region.* Master of Ind. Ed., 1950, North Carolina State College. 76 p. Library, North Carolina State College, Elizabeth City.

Purpose: To determine what subject-matter was covered, the scope of coverage, the plan or organization, and methods used in teaching general related information.

Source of Data: Each State Supervisor of Trade and Industrial Education in the 12 of the Southern Region States was asked to indicate the 10 communities in his State in which outstanding diversified occupations programs were operating. Questionnaires were sent to the local coordinators of these programs. The compilation of data resulting from answers to the questionnaires is shown in tabular form indicating a cross-section of practices in the region.

Findings and Conclusions: Results of study indicate wide variety of practices in region. Summarised data indicates the following: Wide range in division of school day—4 to 8 periods; approximately 75 percent of coordinators scheduled for 3 or more related class periods daily; no set pattern with respect to division of related study time between direct and general related information; general practice indicates majority of coordinators formulate all or part of course of study in general related information; no definite pattern in region of occupational distribution of students; approximately 75 percent of coordinators have school duties other than diversified occupations; majority of coordinators have home rooms composed entirely of diversified occupations students; length of home room periods vary from 5 minutes to 60 minutes; students allowed to enter diversified occupations at beginning of any school semester; coordinator feels better qualified to teach general related information than other teachers in system; coordinators generally agreed on topics to be included in general related; group discussion most commonly employed method of instruction.

3655. McDONALD, CUSTER. *Guide Sheets for Teaching Civic Considerations in the Diversified Occupations Program.* M. S., Oklahoma Agricultural and Mechanical College, 1948. 155 p.

An attempt to select information relating to the civic consideration of diversified occupations students, and organization of the material for presentation.

3656. McKEOWN, RUSSEL J. (Masters). *Outcomes of the Alamosa, Colorado, Part-Time Diversified Occupations Course at the End of Five Years of Its Operation.* Arizona State Teachers College, 1940.

3657. PHELPS, LAURENCE B. (M. Ed.). *Modifications Needed in the Diversified Occupations Program for Alliance, Nebraska.* Colorado Agricultural & Mechanical College, 1944. 70 p.

An investigation of the personal qualities needed by the beginning worker. Recommendations are suggested for administering and supervising a part-time co-operative program.

3658. PINCH, CLAUDE OWEN (M. A.). *A System of Direct Related Study for Co-Operative Students Training in Diversified Occupations.* University of Florida, 1947. 120 p.

Develops three manuals and plans for using them to increase the effectiveness of the Diversified Co-operative Training program. The student study manuals and workbooks are designed to relieve the D. C. T. co-ordinator of many tasks.

3659. RATCLIFFE, FLOSSIE A. (Masters). *An Analysis of the Problems Faced by Coordinators in the Organization, Administration, and Supervision of the Diversified Occupations Program for the Public Schools of Virginia.* University of Tennessee, 1941.

3660. REYMAN, HOWARD ALVIN (M. S.). *An Occupational Survey of Nevada, Iowa with Implications for a Part-Time Diversified Occupational Program in High School.* Iowa State College, 1947. 31 p.

A survey of the occupational opportunities of *Nevada, Iowa and the high school students'* vocational preference to determine the need for establishing in a city of from 3,000 to 5,000 population, a co-operative part-time diversified occupational program in the high schools.

3661. ROACH, WILLIAM MONROE. *A study of the Combination Industrial Arts—Diversified Occupations Programs.* M. of I. A., 1953, North Carolina State College. 18 p. Library, North Carolina State College, Raleigh.

Purpose: To ascertain the feasibility and practicability of the combination Industrial Arts—Diversified Occupations Program.

Source of Data: Data were secured through questionnaires sent to State Superivsors of Trades and Industries in forty-two states which have D. O. programs and the Insular Supervisor of Trades and Industries of Puerto Rico. Questionnaires were also sent to twenty-six teachers in combination programs.

Findings and Conclusions: Whenever possible it is better to have industrial arts and diversified occupations taught by different persons, due largely to the time factor.

3662. SANDVIG, GEORGE L. *A Guide to the Teaching of General Related Material for Diversified Occupations Coordinators.* M. A., 1949, University of Minnesota. 210 p. Department of Industrial Education, University of Minnesota. Minneapolis.

Purpose: To develop a guide for teaching general related material in a diversified occupations program.

Source of Data: Published materials.

Findings and Conclusions: A guide to aid the the diversified occupations coordinator was developed.

3663. SCHAEFER, JOHN C. *A Program of Diversified Occupations.* M. A., 1950, Ohio State University. 81 p. Education Library, Ohio State University, Columbus.

Purpose: A Study of the opinions of representatives of labor and management to determine the need for a program of diversified occupations by the public schools of Sandusky, Ohio.

Source of Data: The questionnaire and personal interview technique was used to secure the data desired. Answers to 133 questionnaires were secured.

Findings and Conclusions: A need exists for: More intensified training in the senior years for boys who were planning to enter the mechanical trades in industry; management, labor, and union officials have a sincere interest in a cooperative work-study program in the building trades; the program should be conducted during a recession as part of the school's training so that when employment is again plentiful the youth of the community will be adequately trained.

3664. SHADLE, OWEN J. *Evaluation of a High School Diversified Occupations Program by Analysis of Job Adjustment of Selected Graduates.* M. S., 1953, Iowa State College. 44 p. Library, Iowa State College, Ames.

Purpose: To ascertain the comparative job adjustment of students who took Diversified Occupation Training with those who did not.

Source of Data: This group consisted of 168 high school graduates from Charles City, Iowa, high school, none of whom had attended college. The criterion consisted of an employer rating. Covariance technique was used.

Findings and Conclusions: No advantage could be demonstrated in favor of the coop students on the items rated. Approximately 79 per cent of the students who had taken coop training were employed in the industry in which they had been trained.

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3665. SILVEY, WRAY D. *Ability and Scholastic Success in High School and College of Diversified Occupations Students Versus Non-Diversified Occupations Students.* Ed. D., 1950, University of Missouri. 128 p. Library, University of Missouri, Columbia.

Purpose: To compare the ability and scholastic success in high school and college of students who had Diversified Occupations in high school with students who did not have Diversified Occupations in high school, and thus to determine whether Diversified Occupations students are good college risks.

Source of Data: Information forms were sent to 54 coordinators in as many Missouri high schools to obtain the names of the 1945–49 graduates having had Diversified Occupations and later entering college. The names of the colleges in Missouri which these students had attended or were attending were obtained. These colleges were then visited and the necessary information obtained.

Findings and Conclusions: The mental abilities of the Diversified Occupations Grouping going to college, as measured in high school, were slightly higher than those of the Non-Diversified Occupations Group going to college. The high school percentile rank of the Non-Diversified Occupations students was slightly higher than that of the Diversified Occupations students. The number of credits earned in high school by the Non-Diversified Occupations Group was slightly more than those earned by the Diversified Occupations Group. The extent to which the 2 groups participated in extra-curricular activities in high school was about the same. More Diversified Occupations students than Non-Diversified Occupations students participated in one activity. However, more Non-Diversified Occupations students participated in four or more activities. Slightly more students in the Diversified Occupations Group than in the Non-Diversified Occupations Group were elected or appointed to a student office in high school.

3666. SMITH, GORDON A. *A Part-Time Cooperative Program in Diversified Occupations at Chattanooga Central High School, 1940–1941 to 1954–1955 Inclusive.* M. S., 1955, University of Tennessee. 145 p. Library, University of Tennessee, Knoxville.

Purpose: To examine and evaluate the part-time cooperative program in Diversified Occupations at Chattanooga Central High School over a fifteen year period.

Source of Data: Data were secured from reports in district and state offices, and through a follow-up form mailed to graduates.

Findings and Conclusions: During the operation of this program 423 students had been trained in 45 different occupations. The number of approved reimbursable occupations showed a steady decline during the period. Of the graduates reporting, only sixteen per cent were not working in occupations related to the training they received. Some of the graduates continued their education beyond high school. Salaries of the graduates ranged from $150 to $350 per month.

3667. STEWART, JOHN P. *The Part-Time Cooperative Vocational Training Programs in Maryville High School, Maryville, Tennessee.* M. S., 1953, University of Tennessee. 112 p. Library, University of Tennessee, Knoxville.

Purpose: To review and evaluate the D. O. and D. E. part-time cooperative vocational programs in the high school of Maryville, Tennessee.

Source of Data: Data were obtained by questionnaire and personal contacts.

Findings and Conclusions: The D. O. program was started in 1938 and the D. E. program in 1950. Prior to 1938, the curriculum was strictly college preparatory. Fifty-one per cent of those trained under these programs were in trade and industrial occupations, thirty-four per cent in distributive occupations and fifteen per cent in office occupations. There is ample opportunity for on-the-job training in the community.

3668. STOVALL, WILLIAM DAVIS RATLIFF (M. Ed.). *The Organization and Administration of Diversified Occupations in Jackson, Mississippi.* University of Texas, 1939. 98 p.

Describes the organization and administration of a three year program of diversified occupations in a southern city of 75,000 population.

3669. TURNEY, LOUIE C. *Promotion of Diversified Occupations Co-operative Part-Time Program for High Schools.* M. S., Oklahoma Agricultural and Mechanical College, 1947. 32 p.

A compilation of facts and opinions relative to establishment and operation of co-operative diversified occupations program.

3670. WELSH, LOWELL A. (M. Ed.). *A Course in Personality Development for the Students in the Diversified Occupations Program at the Nebraska City High School.* Colorado Agricultural & Mechanical College, 1944. 68 p.

A course outline for a program of personality development. The factors that make for a well-rounded personality and various traits and their difficulties are discussed.

Training in Industry

3671. ARMSTRONG, GEORGE MURRAY. *The Scope and Variety of Materials Available for Foreman Training.* M. S., 1954, Purdue University. 24 p. Library, Purdue University, Lafayette, Ind.

Purpose: To ascertain the extent of instructional materials which may be used in the training of foremen, and to classify such materials as are available into categories indicative of the duties and responsibilities of foremen.

Source of Data: Data were obtained from literature on file at Purdue University libraries.

Findings and Conclusions: A foreman's function can be divided into thirteen different categories. Magazine articles, company publications, and books are available to fit each of the duty classifications. To facilitate selection and classification of materials for foremen training, clear-cut definitions of "foreman," "supervisor," and "management" are needed. There is a need for industry to analyse and classify foreman responsibilities and to index foreman training materials annually.

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3672. BADER, LOUIS (Ph.D.). *Survey of Course Construction for Sales Training in the Electrical Industry.* New York University, School of Education, 1932. 222 p.

A study of sales training programs of the twenties for some of the major electrical companies. It recommends that college courses in sales training be followed by specific training.

3673. BECKETT, RICHARD W. (Masters). *A Survey of Employee Educational Activities in the Pacific Gas and Electric Company.* Stanford University, 1941.

3674. BOOKER, LEONARD ROWLAND (M.S.). *A Study of the Efficiency and Economic Value of Certain Loomfixing Classes in Cotton Mills of South Carolina.* University of Tennessee, 1932. 198 p.

An effort to evaluate objectively eighteen classes in loomfixing in twelve textile mills in South Carolina during 1928–1931. Classes were evaluated in terms of the efficiency factors set up by Wright and Allen in "Efficiency in Vocational Education."

3675. BRITTENHAM, EDWARD ARTHUR, Jr. (M.S.). *An Evaluation of Foreman Training in an Industrial Relations Program.* Massachusetts Institute of Technology, 1938. 119 p.

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3676. BROPHY, JOHN M. (Ph.D.). *Education and Training in the Industries of Upstate New York.* Cornell University, 1947. 300 p. (Published, Research Bulletin No. 1, by the New York State School of Industrial and Labor Relations, Cornell University, Ithaca, N. Y.).

A study of the administration, organization, and operation of plant training programs in upstate New York, with emphasis on plants having over one thousand employees.

3677. BROWN, THEODORE CECIL (M.S.). *A study of Present Drafting Methods and Practices in Industry.* North Carolina State College, 1940. 69 p.

An investigation of the present practices in industrial drafting, covering industries within the State of North Carolina, in an effort to provide standard drafting practices which will aid trade schools and colleges in setting up their courses.

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3678. BROWN, WALTER C. *Hiring, Advancement, and Training Practices in Selected St. Louis Area Industries.* Ed. D., 1954, University of Missouri. 204 p. Library, University of Missouri, Columbia.

Purpose: The purpose of the study was to obtain information relative to the hiring, advancement, and training practices in industrial-type jobs in selected St. Louis area industries and to ascertain how education relates to these practices.

Source of Data: Date for the study were obtained from the Missouri Division of Employment Security; management associations in the area; interviews with personnel men and training officials in the selected industries; record forms and labor-management contracts; and literature pertinent to the study. The study included 46 industries in 15 major industrial groups in the St. Louis area.

Findings and Conclusions: All industries were unionized except one. The union shop type of union security occurred more frequently than any other. The mean minimum hiring age of the industries was 18.5. Over half the industries had a practice of hiring "all races"; however, fewer industries preferred to do so. Over one-half the industries hired handicapped workers where they could do the work. Four-fifths of the industries had no minimum formal education requirement for applicants. The majority of industries gave preference to applicants who had had special training with approximately one-fourth making it a requirement for employment on certain jobs. Seniority was the chief factor in promotion of workers, and low seniority was the primary factor in determining the order in which workers were laid off. In promotion of workers to supervisory positions, "qualifications of the worker" was the controlling factor. Slightly less than half the industries rated their workers on merit. In less than half the industries, workers could transfer from one department or job family to another in present grade or higher. In 41 of the 46 industries, industrial training of one or more types was provided industrial workers by either the industry, the union, or both.

3679. BROWNING, LINCOLN C. *Leadership Training in Industry.* M. Ed., 1947, Wayne University. 60 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To point out the need for leadership training in industry, and to develop methods to be practiced in developing leadership training.

Source of Data: Data were obtained from the Department of Industrial Education, Chrysler Corporation, and books and periodicals.

Findings and Conclusions: Leadership may be developed by anyone with normal leadership capacity who puts the necessary study and self-training into the task. It is necessary for leaders to keep in mind that they are dealing contsantly with human beings who possess the same aspirations, instincts, and tendencies as their leaders.

3680. BUNN, JOHN W. *Induction and Orientation of New Employees.* M. S., 1954, Purdue University. 30 p. Industrial Education Office, Purdue University, Lafayette, Ind.

Purpose: To provide persons employed in training and personnel departments with a reference bibliography which will aid in planning and organizing induction or orientation programs.

Source of Data: Data were secured through a study of the literature published between January 1950 and May 1954.

Findings and Conclusions: The objectives of orientation are clear, however, the scope is wide and varied. There is no "one" program applicable to the many unique situations that characterize our complex industrial society. The job of developing and organizing an orientation program should be delegated to a specialist and decentralized through departmental organizations.

3681. BUXTON, GEORGE FRED (M. S.). *An Analysis of the Problem of Factory Teacher Training in Indiana.* Indiana University, 1936. 55 p.

A study dealing with the problem of factory teacher training in Indiana. Foremen's need for training and the value of such training are discussed.

3682. CAMMACK, KIRK V. (M. S.). *Mine Gases and Ventilation.* Indiana State Teachers College, 1943. 193 p.

An analysis of the available scientific materials on this topic in an effort to organize the material for the preparation of a text for training purposes.

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3683. CRUDDEN, PAUL BERNARD (Ed. D.). *The Training of Production Supervisors at the Philadelphia Navy Yard During World War II.* University of Pennsylvania, 1944. 214 p.

A description of the steps employed in the development of a training program for production supervisors. The data are based on the author's personal experiences at the Navy Yard, 1940–1944.

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3684. CUTLER, THEODORE HAROLD. *In-Service Training Programs Within Industry in Denver.* Ph. D., University of Colorado, 1948. 203 p.

A descriptive analysis of the training within industry programs operating in Denver, Colorado. Data were based on personal interviews with senior personnel or supervisory officers of 100 industrial organizations.

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3685. DANAHER, EUGENE L. (Doctors). *The Federal Training-Within-Industry Program.* Stanford University, 1946.

3686. DEMANGONE, ANTHONY M. (Masters). *Training-Within-Industry of Foremen and Supervisors under the War Manpower Commission.* University of Pittsburgh, 1944.

3687. DRUMRIGHT, WILLIAM T. *The Background and Training Desired in Operating Employees by a Sampling of Tennessee Industrial Plants.* M. S., 1949, The University of Tennessee. 97 p. Library, University of Tennessee, Knoxville.

Purpose: To secure opinions of Tennessee industry regarding present background and training of industrial operating personnel; to have industry inform educators how schools can best train a student to meet the needs of his future job; to bring industry and schools closer together in meeting the needs of all concerned.

Source of Data: A survey was made covering 43 trades employed in the 16 leading industries located in 49 of the 95 counties of Tennessee. Forty-six industries answered 15 questions regarding the relationship between industry and the public school system, as it affected industrial workers. The types of industries covered were determined by the size of the payroll. Counties whose inhabitants received less than $250,000 per year as wages from industry were omitted.

Findings and Conclusions: Pre-employment training at the high school level could be of benefit to a youth seeking employment for the first time. Of the 23,959 operating personnel, 32 per cent of 7,667 individuals are high school graduates. One-third of the firms believed there are definite values obtained in high school by the prospective employee which might be carried over to the job. High school graduates and non-graduates start at about the same rate of pay. High school graduates progress faster than the non-graduates; and a high school education is definitely helpful. Industrial leaders advocate having their operating personnel possess some pre-employment vocational education at the high school level. Industrial leaders believe that high schools should offer a more specific vocational program and should work to a greater extent with industry in planning high school programs. The study recommends long range planning; an extended program of vocational guidance; that the State Department of Education Staff assist school administrators in determining the needs of the individual worker; and that school authorities and industrial leaders work together to determine the educational services which will contribute most to both the individual and the community.

3688. DUNN, PAUL CHAFFEE (M. S.). *The Selection and Training of Railroad Supervisors.* Massachusetts Institute of Technology, 1941, 111 p.

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3689. EISS, ALBERT F. *A Determination of the Relative Importance of Knowledges of Science to the Duties* *of Hotel Managers.* Ph. D., 1954, New York University. 161 p. Library, New York University, New York.

Purpose: To identify and classify under their proper subject matter headings the scientific knowledge that hotel managers need in performing their duties.

Source of Data: Data were obtained from periodicals, textbooks, and a survey of the duties of hotel managers in 75 hotels in New York State.

Findings and Conclusions: There was a wide variation in the extent to which the various hotel managers performed duties requiring knowledge of science, but in most cases considerable knowledge of science was needed. A total of 640 scientific items were identified. Knowledge related to health and safety was of paramount importance. Most of the informational items were classified under the subject-matter headings of physics and bio-chemistry.

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3690. EVANCHO, MICHAEL. ***Predicting Training and Employment Success of Electric Arc Welders.*** **Ph. D., University of Pittsburgh, 1947.**

This study covered the employment records of 321 welders who were employed and trained by the Dravo Corporation, Pittsburgh, Pa. Comparisons were made between success on the job and achievement in the welding course.

3691. FONG, TSUNG-SEN (M. S.). ***Application of Photography in Employee Training.*** **Massachusetts Institute of Technology, 1938. 71 p.**

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3692. FOLTMAN, FELICIAN F. ***Factors Bearing on Supervisory Morale—An Analysis of a Training Program, the Philosophy of Managemnt, and Certain Personnel Practices.*** **Ph. D., 1950, Cornell University. 375 p. Library, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.**

Purpose: To determine the place and function of an industrial training program with respect to the morale of supervisors, and to determine whether the morale of supervisors can be used as one indication of the effectiveness of a supervisory training program.

Source of Data: A case study with a combination of personal observations and examination of certain types of objective data. Interviews with staff members of the personnel department, and foremen.

Findings and Conclusions: Some of the conclusions were: One of the major areas for further training was found to exist in the first factor of morale—the purpose of the organization; many of the larger problems which directly affect morale of supervisors cannot be attacked through training except as a supplementary device to other management action; there is a recurring need to explain the function of supervisors who are between the foremen and their president; the interpretative function of training has direct effect on the morale of supervisors; an initial participation in the formulation of new policy by foremen can be obtained through the training department; and the training meetings are conducive to higher morale.

3693. FRANKSON, CARL E. (M. Ed.). ***Organization of Adjustment Service for Semi-Skilled Mechanical Occupations.*** **Colorado Agricultural & Mechanical College, 1940. 307 p.**

An analysis of 125 jobs performed by semi-skilled mechanical workers to determine what the trainee must know and be able to do. A comparative program for the preparation of semi-skilled workers is devised.

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3694. FRYKLUND, VERNE C. (Ph. D.). ***The Selection and Training of Modern Factory Workers.*** **University of Minnesota, 1933. 384 p.**

An investigation, emanating from the Minnesota Employment Stabilization Research Institute, which provides data on the use of aptitude tests in the selection of factory workers. Recommendations for industrial training programs are included.

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3695. FURIA, JOHN J. (Doctors). ***The Plant School as a Form of Vocational Education.*** **Teachers College, Columbia University, 1930.**

3696. GEISER, MELVIN GOTTELIEB. ***Proposals for Revising Job Instruction Training—Training within Industry.*** **M. P. S., 1953, University of Colorado. 206 p. Library, University of Colorado, Boulder.**

Purpose: To examine the history and objectives of the Training Within Industry program, and to recommend revisions based on current theories and techniques of education and psychology.

Source of Data: Data were obtained from a review of the literature. An analysis was made of Job Instruction Training and the changes in educational and psychological theory since World War II.

Findings and Conclusions: Job Instruction Training needs revision in order to be adaptable to, and successful in, peace time use.

3697. GOODE, CECILE (M. S.). ***A Survey of Job Training Programs in Industry.*** **Purdue University, 1938. 86 p.**

From an analysis of 226 usable questionnaires from companies in the United States, typical purposes, effects, and methods of evaluating training programs are described. The prevalence of job training and the methods used in training employees are considered.

3698. GRISWOLD, EARL F. (Masters). ***An Intensive Training Course for Industrial Supervisors.*** **University of Tennessee, 1945.**

3699. HANSEN, LAWRENCE W. ***The Status of Factory Schools For Automobile Mechanics Teachers.*** **M. S., 1953, Kansas State Teachers College. 33 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.**

Purpose: To assemble information on various factory training schools in the automotive mechanics field.

Source of Data: Data were obtained from literature on factory schools from forty-two manufacturers and a questionnaire sent to these manufacturers.

Findings and Conclusions: Recommendations are made to industry for in-service training, and to teacher training institutions. College credit for attendance at factory operated schools is advocated.

◆ **3700. HEARN, ARTHUR ROBERT GORDON (Ph. D.).** ***The Training of Discussion Groups; An Experimental Study.*** **Massachusetts Institute of Technology, 1948. 389 p.**

3701. HERRIN, VIRGINIA T. (M. S.). ***A Survey of the Employees in Certain Trades and Industries in Los Angeles.*** **University of Southern California, 1941. 77 p.**

A study of the efficiency of vocational training in aircraft mechanics, upholstery, automobile mechanics, and metalwork in the Los Angeles schools in relation to the demands to be met on the job after completion of the courses.

3702. JENKINS, ROY W. (M. A.). ***Training Workers in Industry.*** **Ohio State University, 1935. 96 p.**

A study of industrial training which formulates plans for training in industrial plants. Historical background of apprenticeship training is given from 1275 to 1935. Information was secured from plants in and out of Ohio.

3703. JENSEN, JOHN C. ***An Analysis of the Job Instructor Training Program in Canada During World War II.*** **M. S., 1949, The Stout Institute. 90 p. Library, The Stout Institute, Menomonie, Wis.**

Purpose: To study the Job Instructor Training program in Canadian war industries and in the armed services.

Source of Data: A review of the literature was made on job instructor trainng in the United States and Canada. The writer, a member of the first conference for the technical trades of the Royal Canadian Air Force during World War II, drew from his personal experiences. During this program he conducted forty-one conferences in which he gave four hundred ninety-two instructors training which directly affected the teachnical upgrading of approximately twelve thousand men. Brief reviews of Job Relations and Job Methods courses are included. A detailed analysis of the Job Instructor Training course, session by session, comprises the major part of the investigation.

Findings and Conclusions: It is recommended that: This course, combined with a course in Trade and Job Analysis, be offered in teacher's colleges; a course based on the "J" programs of industry be made available to counsellors, coordinators, and personnel managers.

3704. KOLB, CHARLES E. ***A Study of Experience and Educational Backgrounds of Persons Engaged in Training Personnel in Maryland Industries.*** **M. A., 1955, University of Maryland. 52 p. Library, University of Maryland, College Park.**

Purpose: To compile information on the education and experience of industrial training personnel, with the intent of establishing approaches to the preparation of additional personnel.

Source of Data: Data were secured through a study of the membership of the Maryland Society of Training Directors.

Findings and Conclusions: No single dominant pattern of preparation was found among training personnel. College level education was considered desirable and work-experience was rated equally significant. There was an attendant urging of the development of a college-level program intended to prepare training specialists. The currently operating "Education for Industry" curriculum at the University of Maryland appeared to have the essential qualities of a training specialist's college program.

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3705. LANMAN, RICHARD WARREN. *The Construction of a Forced-Choice Test for Industrial Trainers.* Ph. D., 1953, Purdue University. 56 p. Library, Purdue University, Lafayette, Ind.

Purpose: To develop a generally usable rating scale for industrial trainers; to examine the way in which subordinates, peers, and superiors regard the various aspects of training behavior; and to test certain hypotheses relevant to the methodology of the forced-choice technique.

Source of Data: Data were secured in the following manner: a critical behavior letter was sent to training directors in 85 different industries; a tape recorded trainers conference was conducted at which trainers expressed ideas and opinions about trainers; and job descriptions of the work of a number of different trainers were analyzed.

Findings and Conclusions: A forced-choice type of evaluation instrument resulted from this study which is known as the Trainer Performance Indicator with three forms: Form T, Form P, and Form I. This instrument may be used by training directors, trainers, and trainees to rate the effectiveness of the performance of trainers. The forced-choice technique of rating is used since it forces the rater to make choices which he might otherwise not have made. Validation results on ratings of trainers by superiors and peers resulted in correlations ranging between .4 and .8 for varied industries.

3706. LILLICK, DOROTHY M. *The Development of Training Within Industry Services, District 10, Cincinnati.* M. Ed., University of Cincinnati, 1945. 147 p.

An historical review of the development of the training-within-industry services and a study of its present status.

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3707. LINDAHL, LAWRENCE GAYLERD (Ph. D.). *Movement Analysis as an Industrial Training Method.* Purdue University, 1944. 87 p.

An analysis of the foot movement on an abrasive cut-off operation through paper tape tracings with a pen connected to the machines. A training program based on this analysis was developed and the results are recorded.

3708. LOCKHART, RICHARD (Masters). *The Preferences of Personnel Men Concerning Vocational Education.* University of Akron, 1944.

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3709. MAXCY, ELLIS O. (Doctors). *Education in Industry.* Yale University, 1941.

3710. MEAD, GEORGE E. *The Nature and Extent of Instructor Training Given to On-the-Job Instructors.* M. S., 1954, Purdue University. 39 p. Industrial Education Office, Purdue University, Lafayette, Ind.

Purpose: To ascertain the nature and extent of training given to on-the-job instructors and the approximate per cent of industries employing this method of training.

Source of Data: Data were gathered by means of 239 questionnaires sent out to manufacturing concerns throughout the U. S., 132 of which were returned. The questionnaire consisted of fifteen items regarding instructor training.

Findings and Conclusions: On-the-job instructors were used by 48 per cent of the companies responding. These instructors were chosen because of their knowledge of the job, willingness to teach, and ability to get along with people. The majority of the companies give their on-the-job instructors extra pay for teaching.

3711. MEAD, GEORGE E. *The Pre-Employment Education of Training Personnel.* M. Ed., 1954, Purdue University. 69 p. Library, Purdue University, Lafayette, Ind.

Purpose: To ascertain the type and content of pre-employment education that is most suitable for the preparation of prospective training personnel in business and industry.

Source of Data: Data were secured through a study of the literature and by means of a questionnaire distributed to selected individuals who are prominent in the field of industrial training.

Findings and Conclusions: A specialized educational program designed to prepare people for entrance into the industrial training field was considered to be beneficial to the profession. Such a curriculum should include courses in industrial education, industrial psychology, and business administration. The curriculum should also include instruction in methods of determining training needs, selecting and training instructors, evaluation of training programs, and preparation of course outlines and instructional outlines.

3712. MILLER, JOSEPH VENNE (M. S.). *A Study of the Training Methods Used by a Major Aircraft Industry in War Time.* Oregon State College, 1942. 59 p.

An analytical description of the training methods used by the Lockheed Company. Charts are included showing the school subject preparations needed for the various jobs in an aircraft plant.

3713. MORGAN, THOMAS E. *Fire Service Training in Tennessee in Cooperation With the State Board of Vocational Education.* M. S., 1954, University of Tennessee. 60 p. Library, University of Tennessee, Knoxville.

Purpose: To examine and evaluate the program of fire service training in Tennessee.

Source of Data: Data were secured from records of the Tennessee State Fire Service Training School and from the Trade and Industrial Service.

Findings and Conclusions: Ten annual sessions of the State Fire Service School were conducted at Murfreesboro during this period. A full-time itinerant instructor in fire service training conducted classes during each year of the ten year period, 1944–1953. Increasing attendance seems to indicate definitely that executives believe instruction offered by the State Fire Service School is of value.

3714. O'BRIEN, TERENCE MICHAEL (M. A.). *A Survey of Selection and Training Among Tri-Cities Industries.* State University of Iowa, 1939. 85 p.

A study covering the practices and techniques of employee selection and training in twenty-five companies located in one city, Davenport, in Iowa, and three others, Rock Island, Moline, and East Moline, in Illinois.

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3715. O'NEILL, JACK HENRY. *An Analytical Survey of Personnel Practices in Fifty-Seven Industries in Indiana.* Ph. D., 1954, University of Michigan. 210 p. Library, University of Michigan, Ann Arbor.

Purpose: To ascertain the differences and similarities of personnel practices in industry with those of modern secondary schools.

Source of Data: Data were obtained from a questionnaire submitted to a jury of selected personnel men for evaluation. The questionnaire and an explanatory letter were then sent to those Indianapolis, South Bend, Mishawaka, and Elkhart industries which were classified in Division D, manufacturing, in the *Standard Industrial Classification Manual.*

Findings and Conclusions: While many interesting variations in practices were found in individual instances, the standard statistical method of testing hypotheses shows that the degrees of variation are of such proportions as to verify, at least in most cases, the conclusions that practices are more uniform than disparate in each of the five categories of the study. By and large, there is a degree of "unity in diversity" of personnel practices among the fifty-seven industries which provided data. Their operations reveal a loose pattern of practices within which specific variations are numerous and largely governed by chance variations.

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3716. PARNES, SIDNEY J. *A Study of General Books Published for Supervisors in Industry Between 1920 and 1950.* Ph. D., 1954, University of Pittsburgh. 238 p. Library, University of Pittsburgh, Pittsburgh, Pa.

Purpose: To analyze books published in the United States before 1951 for supervisors in industry, with emphasis on the human factors in supervision.

Source of Data: Data were obtained through a documentary survey. By a delimiting process, 53 books were selected for detailed analysis.

Findings and Conclusions: Authors of the books analyzed were found to represent chiefly four professions: management consultants, industrial executives, university professors, and vocational educators. Most often these writers designed their books as self-study aids for supervisors already on the job. Differences in emphasis were found between books ostensibly for foremen and the others. Although the number of books published has increased, little change has occurred in the general nature of the books over the 30 year period. Authors consistently stressed the idea that the same progress had to be made in the human factors of supervision as had already been accomplished in the technical aspects. Accordingly, 56.1 per cent of total subject matter in all analyzed books was found to be devoted to topics stressing the supervisor's managing of his personnel. Although increased usage was made of research findings in recent books, many of the analyzed publications contain numerous assertions for which no scientific evidence seems to be offered. It is concluded that much additional research appears to be needed in order to test the validity of these assertions.

3717. PERSONS, RALPH C. (Masters). *Corporation Schools in the United States.* University of Southern California, 1933.

3718. PETERS, ROBERT LYMAN (Masters). *An Analysis of Employee Training in Gas Utilities on the Pacific Coast.* University of Southern California, 1939.

3719. PETERSEN, CHARLES F. (M. S.). *An Efficient Plan of Preparatory Training in Telephony.* Colorado Agricultural & Mechanical College, 1938. 356 p.

An analysis of the training needs of the employees of the Wisconsin Telephone Company, and the preparation of an evaluated course of study based on job analysis.

3720. PREATOR, FREDERICK (M. (M. Ed.). *The Objectives of Industrial In-Plant Training.* Wayne University, 1947. Published: Wayne University, 1947. 68 p.

The objectives of industrial training are sought through an examination of the curricula, the staff, methods of administration, and general character of in-plant training programs in automotive plants in the Detroit area.

3721. REEVE, DAVID F. *A Survey of Duties and Responsibilities of Training Personnel in Business and Industry.* M. S., 1953, Purdue University. 42 p. Library, Purdue University, Lafayette, Ind.

Purpose: To compile information on the scope of duties and responsibilities of people employed in training.

Source of Data: Data were obtained through questionnaires from 564 members of the American Society of Training Directors in the United States and Canada.

Findings and Conclusions: Organizations with less than 1,000 members are not emphasizing the training function to any large degree. Over 50 per cent of the training personnel were under the age of 40. Sixty (60) per cent of the training program had been in operation ten years or less. Fifty-one (51) per cent of the annual salaries ranged from $6,000 to $10,000, with 15 percent receiving annual salaries ranging from $10,000 to $30,000. Management most frequently selects training personnel from those having teaching or personnel experience, with a college education almost a must. Training personnel are called upon to perform a wide variety of activities, some of which are not specifically of a training nature, but do offer the possibility of developing training programs.

3722. SALVESON, MELVIN ERWIN (M. S.). *In-Service Training of Executive Personnel.* Massachusetts Institute of Technology, 1947. 392 p.

3723. SCHOEPPLER, JACOB. *The Development of Educational Programs at Chrysler Corporation.* M. Ed., 1949, Wayne University. 53 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To record the history of Chrysler Corporation's educational programs.

Source of Data: Data were obtained by personal interview with members of the Chrysler Corporation, periodicals, and press releases.

Findings and Conclusions: Training is not done for the sake of training alone, but to satisfy some specific need. The Corporation has not duplicated the activities of other educational institutions, but has tailored its training activities to suit its own needs.

3724. SCHUKNECHT, ARNOLD GLEN. *Employee Incentives Used By One Hundred and Fifteen Businesses and Industries.* M. P. S., 1952, University of Colorado. 73 p. Library, University of Colorado, Boulder.

Purpose: To ascertain and evaluate the incentive plans used by industry.

Source of Data: Data were secured through questionnaires sent to one hundred fifteen businesses and industries.

Findings and Conclusions: The incentives used most frequently were not ranked highest in effectiveness. Monetary incentives were least popular but were ranked as most effective. The most popular incentives were security and status, whereas relaxation and leisure time were least popular. Sixty per cent of the industries indicated that they undertook objective evaluation of their incentive programs.

3725. SMITH, MARION W. (Masters). *Evaluating Wisconsin's Foreman Training Program.* University of Wisconsin, 1933.

3726. STEGER, LEE D. *The Apparent Need and Implications For Professional Educators in Texas Industries.* M. Ed., 1951, Agricultural and Mechanical College of Texas. 48 p. Industrial Education Department, Texas Agricultural and Mechanical College, College Station.

Purpose: To ascertain the duties of professional educators employed in industry, and to learn what schools should do to better train individuals to fill these positions.

Source of Data: Data were obtained from questionnaires, books, and periodicals.

Findings and Conclusions: Schools should set up curriculums that would provide both laboratory experience and academic information. The academic or related courses should include a study of labor unions, labor laws, personnel relations, coursemaking, and training methods.

3727. STIGERS, MARQUIS E. (M. S.). *An Inventory of Foreman Characteristics.* Purdue University, 1942. 15 p.

The description of the rating of 317 foremen by their supervisors, three supervisors rating each man independently. Each foreman completed two inventory blanks and the group was divided into high fourth, middle half, and low fourth on the basis of the supervisors' ratings.

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3728. TIERNEY, WILLIAM FRANCIS. *Education for Industry: A College Level Program Emphasizing Technical and Pre-Supervision Preparation for Manufacturing and Selected Service Industries.* Ed. D., 1952, University of Maryland. 183 p. Library, University of Maryland, College Park.

Purpose: To obtain information essential to the development of a college level program intended to prepare persons for management positions of the semi-professional or junior executive type and to ascertain the reaction of Maryland industrialists to the program.

Source of Data: Data were obtained from survey forms sent to industrialists in Maryland, from an examination of comparable programs operating in other institutions, and from an examination of data pertaining to in-plant training programs of selected industries.

Findings and Conclusions: There is a definite need in Maryland for a four year college level program for the preparation of semi-professional and technical personnel. The supervision of production workers involves greater responsibility in industry today than formerly, and hence a broader type of preparation is needed. The technical and personal qualifications expected in new employees at the semi-professional or technical level imply the need for a diversified program which cuts across several educational fields. Maryland industries are willing to provide temporary employment for student trainees in positions of educational value. Employment outlook for graduates is good. Prospects of graduates advancing to positions of greater responsibility in a period of four or five years are promising. The University of Maryland, by utilizing existing facitities, can provide a valuable service to students and to the manufacturing and service industries of the state.

3729. TURKES, WALTER ROBERT (Masters). *A Suggested Procedure for Teaching Production Planning and Control.* University of Pittsburgh, 1939.

3730. VAN WYCK, PHILIP S. (M. S.). *Units of Instruction for the Diesel Road Engineer.* Colorado Agricultural & Mechanical College, 1939. 96 p.

A survey of railroad officials to determine the duties of locomotive engineers in operating Diesel locomotives. A training program, including organization of content and methods of procedure, is outlined.

3731. WALTERS, WILLIAM CECIL. *The Educational Preparation and Training of Recent Employees of Certain Industrial Plants in Hartsville, South Carolina.* M. S., 1952, University of Tennessee. 92 p. Library, University of Tennessee, Knoxville.

Purpose: To ascertain the educational background of recent employees of selected industrial plants.

Source of Data: Data were secured through a follow-up of recent high school graduates and drop-outs and through conferences with personnel directors of 23 industrial plants in the area.

Findings and Conclusions: Personnel men express belief that high school graduation is desirable because many jobs require more technical knowledge and skill. The need for closer cooperation between industry and school is evident. It was recommended that the possibility of adding additional industrial courses to the high school curriculum be explored with the hope of increasing the holding power of the school and contributing more definitely to the vocational preparation of the students.

3792. WILLIAMS, JOHN CLIFTON. *An Integration Study Of The Research Experimentation, and Application Of Group Techniques In Industry.* M. P. S., 1954, University of Colorado. 140 p. Library, University of Colorado, Boulder.

Purpose: To gather and integrate information on research, experimentation in, and the application of group techniques in industry to determine how it may be profitably utilized by industry.

Source of Data: Data were obtained by a survey of selected industries.

Findings and Conclusions: Though authority has its place, democratic leadership is superior when applied to management and employees. The status system has disruptive force in group conferences and group production. Group pressures are extremely important and valuable forces, and if properly channeled can benefit the worker and assist management. Democratic techniques are useful in obtaining acceptance and improving quality of decisions.

3793. WHITE, DUNCAN A. (M. S.). *The Power Plant of the University of Tennessee and a Course for Training the Employees.* University of Tennessee, 1935. 93 p.

A study of the early efforts to heat and light the University buildings. The results of a 1933 survey regarding the distribution of power plant service and the organization of power plant jobs are presented. A training course for the University power plant employees is included.

Vocational Rehabilitation

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3794. ANDERSON, RAY N. (Ph. D.). *The Disabled Man and His Vocational Adjustment; A Study of the Types of Jobs Held by 4,404 Orthopedic Cases in Relation to Specific Disability.* Teachers College, Columbia University, 1932.

A study of the specific handicaps of individuals correlated with the various types of occupations in which they have been engaged. The records studied cover the period from April 1917 to April 1930.

3795. ASHBROOK, WILLIAM D. (M. S.). *A Study of the Educational Needs of the Mentally Retarded Boy in a Large Industrial City.* Colorado Agricultural & Mechanical College, 1937. 69 p.

A suggested program for teaching mentally retarded boys. The program includes health, reading, writing, citizenship, and shop activities.

3796. BAKER, LEWIS D. *Preventive Aspects of Industrial Arts Relative to Problem Children.* M. S. in Ind. Ed., 1950, Kansas State Teachers College. 77 p. Porter Library, Kansas State Teachers College, Pittsburg.

Purpose: To determine if a suitable program of industrial arts and related activities could be worked out for the youth of Pittsburg, Kansas.

Source of Data: Pittsburg people concerned with local youth problems were interviewed. Letters were sent to 38 city managers of midwestern towns. Industrial programs were analyzed for activities which might be incorporated into programs proposed for delinquency remedial work.

Findings and Conclusions: The home is one of the major factors in delinquency. Local authorities wish to include industrial arts in the program and to utilize the industrial arts shops and the industrial arts teacher in the summer to provide meaningful activity for the youth.

3797. BARNES, RICHARD KENNETH Jr. *Maryland Rehabilitants Provided with Vocational Training.* M. A., 1951, University of Maryland. 45 p. Library, University of Maryland, College Park.

Purpose: To ascertain the nature of the training and the extent to which Maryland rehabilitants benefited from vocational training.

Source of Data: Data were obtained from the 1950 closed case reports of 217 Maryland clients on file in various district offices and in the division's of the state office.

Findings and Conclusions: One trainee in six was placed in a job inconsistent with his training. Employment training is significantly related to placement. Rehabilitants with tuberculosis, cardiac disorders, and loss of sight, respectively, make more use of available training than do others. The vocational objectives of the disability groups are so varied that it is impractical to provide a list of employment objectives to which a counselor could refer for the best training for a specific disability.

3738. BLAESSING, ROBERT W. *Industrial Arts Activities for Orthopedically Handicapped Children.* M. S., 1951, Stout State College. 70 p. Library, Stout State College, Menomonie, Wis.

Purpose: To ascertain the industrial arts activities being offered, those which should be offered, and the relative value of industrial arts activities to orthopedically handicapped children.

Source of Data: Data were secured through a review of the literature pertaining to the education of orthopedically handicapped children and a questionnaire-checklist distributed to schools serving orthopedic children.

Findings and Conclusions: Elementary industrial arts activities are being used with orthopedically handicapped children for these general educational values. It is recommended that the findings of this study be used in three ways to guide schools serving orthopedic children: In enriching existing industrial arts programs, in adding industrial arts activities to their curriculums, and in realizing the values of industrial arts activities to orthopedic children.

3739. BREWER, JO ANN S. *Handicrafts for the Handicapped.* M. S., 1950, East Texas State Teachers College. 104 p. East Texas State Teachers College, Commerce.

Purpose: To present the place of handicrafts in meeting the problems of handicapped people.

Source of Data: Examination and summary of books, periodicals, publications of learned organizations, unpublished materials and newspapers.

Findings and Conclusions: Occupational therapy has graduated from the basket weaving, embroidering, bead making era to a comprehensive and integrated service. Six crafts are applicable to the handicapped patients.

3740. BROWN, HARRY B. (Masters). *A Study of Employment Experiences of Boys Leaving and Graduating from the Pennsylvania School for Deaf since 1927.* University of Pennsylvania, c. 1935–47.

3741. BRYAN, PAUL D. (M. A.). *A Shop Activities Program for Slow-Learning Boys.* Colorado State College of Education, 1936. 96 p.

A description of a shop activity program for slow learning boys based on immediate needs of the class personnel.

3742. BURRIS, ANGES. *The Workshop and the Physically Handicapped Child.* M. A., 1949, Colorado State College of Education. 108 p. Library, Colorado State College of Education, Greeley.

Purpose: To analyze the educational, psychological, emotional, and physical needs of the physically handicapped child and to show how a workshop in a school for such children can contribute to these needs by aiding the child to become a more normal individual.

Source of Data: Data were obtained from previous studies in this field, question lists from special schools, interviews with parents, and help from organizations interested in the problem.

Findings and Conclusions: All evidence seems to show a definite need for a workshop in schools for physically handicapped but better equipment is needed. The future success of schools for the physically handicapped depends partially upon: More properly equipped school buildings; more college courses which train teachers specifically for the teaching of the physically handicapped; better and more transportation facilities; workshop programs meeting needs of both the handicapped and regular school students; and the passage of state and national legislation which will provide the needed financial aid. Great advancement has been made in the education of physically handicapped children during the last two decades.

3743. CARAKOSTAS, KENNETH. *The Industrial Education Program for Mentally Retarded Children in Detroit.* M. Ed., 1948, Wayne University. 31 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the problems and methods of teaching industrial education to the mentally retarded child.

Source of Data: Data were obtained by personal interview with Special Education teachers in Detroit.

Findings and Conclusions: Large units should be set up to offer more uniform opportunities to all children in special programs. A plan of training in cooperation with the service trades should be set up. Industrial education courses should be more closely related to the type of work done in these shops. The program for the girls should be expanded.

3744. COX, ARCHIE DEAN (M. A.). *Woodwork in the Development of Mentally-Handicapped Boys.* Municipal University of Wichita, 1940. 86 p.

A controlled study of woodwork as a means of educating the mentally handicapped. It investigates the possibility of handwork on an experimental basis as a means of giving mentally retarded students a chance to express themselves.

3745. CROSBY, EDMUND D. (M. A.). *Simplified Sheet-Metal Operation Sheets for Mentally Retarded Boys.* Colorado Agricultural & Mechanical College, 1940. 111 p.

A series of illustrated operation sheets on sheet metal work for boys having an IQ of fifty to sixty.

3746. CUNNINGHAM, ELBERT C. (Masters). *Civilian Vocational Rehabilitation in North Carolina.* George Peabody College, 1936.

3747. DUNCAN, DAVID W. (M. S.). *To Determine If there Is a Need of Industrial Arts Teaching for Special Education for Exceptional Children in the Public Schools of Texas.* North Texas State College, 1947. 51 p.

A survey of the need for industrial arts as a subject matter area in school programs for exceptional children in public schools of Texas, 1937 to 1947. A plan to meet the industrial arts needs of exceptional children is proposed.

3748. EVANS, EDSELL S. *A Study of Forty-Two Mentally Retarded Boys Transferred To Chadsey Trade School From Lyster School.* M. Ed., 1954, Wayne University. 48 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To determine the progress of boys transferred from Lyster School, Detroit (Special Education) to Chadsey Trade School, Detroit.

Source of Data: Data were obtained from personal records and from a follow-up study, including six main areas; general information, academic, personality, shop and handwork, citizenship, and home conditions.

Findings and Conclusions: The boys continued to show some academic achievement. They became poorer in personality and citizenship items related to school work. They were in need of additional help and training in shop and handwork. Home conditions tended to remain static.

3749. FLANAGAN, WILLIAM D. (M.S.). *Guidance Services for Handicapped Persons.* The Stout Institute, 1947. 101 p.

A survey of thirty-nine vocational rehabilitation plans and a compilation of past and present practices in the field of guidance and rehabilitation. It suggests a plan for vocational rehabilitation.

3750. HARMON, JOHN CAMPBELL. *A Proposed Plan of Occupational Adjustment Education for Adolescent Male Patients of the Columbus State School, Columbus, Ohio.* M. A., 1951, The Ohio State University. 162 p. Library, The Ohio State University, Columbus.

Purpose: To design a plan of vocational education that will assist patients to select, prepare for, enter upon, and progress in an area of work with satisfaction to himself and to society.

Source of Data: Data were obtained through publications, interviews, and conferences.

Findings and Conclusions: A select group of institutionalized male retardates may be trained and returned to society to live happy and wholesome lives. This program must change as effective teaching and placement methods evolve.

3751. HOLLISTER, FRANCES M. (Masters). *The Place of Practical Arts in the Education of Handicapped Children.* University of Southern California, 1931.

3752. HOSTETLER, JAMES C. (M.Ed.). *An Industrial Arts Curriculum for the Retarded and Maladjusted Pupils of Bloomington High School.* Colorado Agricultural & Mechanical College, 1940. 68 p.

An industrial arts program for retarded and maladjusted boys. The course is set up with the "remedial" factor as the most important objective.

3753. HREHA, MICHAEL T. *The Therapeutic Value of an Industrial Arts Program for Stutterers.* M. A. 1954, University of Minnesota. 54 p. Department of Industrial Education, University of Minnesota, Minneapolis.

Purpose: To explore the possible therapeutic values of industrial arts offerings for youth who stutter.

Source of Data: Data were obtained from a review of literature in the field and a recounting of personal incidents by the writer.

Findings and Conclusions: The report contains suggestions for teachers in this general area.

3754. JOHNSON, NICK (M.S.). *A Survey to Determine Whether Additional Industrial Arts Teachers are needed for Work in Institutions for Physically and Mentally Handicapped Children and to Suggest Special Preparation for These Teachers.* North Texas State College, 1947. 53 p.

Investigates the need for crafts teachers in the various state institutions for handicapped children and the training thought essential for such teachers.

3755. JONES, EARL W. *A Survey to Determine the On-the-Job Efficiency of the Deaf in Industry.* M. A., University of Michigan, 1945, 89 p.

An investigation of the comparatitve efficiency of deaf workers in an automobile plant producing armament during the last 2 years of World War II.

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3756. KOCH, NORBERT. *Vocational Rehabilitation In Missouri, 1945–50; Its Nature, Extent, Cost, and Effectiveness.* Ed. D., 1951, University of Missouri. 228 p. Library, University of Missouri, Columbia.

Purposes: To ascertain the background, disabilities, training, earnings, and success on the job of disabled persons in Missouri for the years 1945–50, together with the cost and effectiveness of the training and other services received.

Source of Data: Data were obtained from 4,860 closed case reports of the Vocational Rehabilitation Section, State Department of Education, and from 553 closed case reports of the Bureau for the Blind, State Department of Public Welfare. Employee ratings were obtained through information forms sent to employers of rehabilitated persons.

Findings and Conclusions: A majority of rehabilitants have previous work experience. Since the educational level of rehabilitants is low, the occupational choice of most of them is limited to occupations requiring training of less than college grade. More clients are disabled by disease and congenital defects than by employment accidents. Of the clients handled by the Vocational Rehabilitation Section requiring vocational training, a majority utilize colleges, universities, or private trade schools; of those handled by the Bureau for the Blind, a majority receive sheltered workshop or home bound training. Rehabilitants are employed in a wide range of occupations, indicating that no form of employment is completely closed to them. Since rehabilitants compare favorably in job adjustment and job performance with other workers, their vocational handicaps seem to make little difference once they have been rehabilitated. The cost of rehabilitating disabled persons is more than compensated for by their increased earnings, not to mention the alleviation of dependency. The program of vocational rehabilitation has proved to be both socially and economically desirable.

3757. LAMSON, PAULINE, (M .S.). *Vocational Rehabilitation through the Food Trades at Frank Wiggins Trade School.* University of Southern California, 1935. 132 p.

A study of training for the food trades in terms of type of training, success of graduates, and placement opportunities, as learned at Frank Wiggins Trade School.

3758. LILLY, BOB THOMAS (M. S.). *A Study of Vocational Rehabilitation of Disabled Citizens of Texas.* A & M College of Texas, 1939. 45 p.

A study of the Texas vocational rehabilitation program, with recommendations for its improvement.

3759. LYNDS, MURRAY D. (M. S. in Ed.). *A Proposed General Vocational Program for Dull Normal Boys.* Cornell University, 1941.

3760. LYTLE, HILTON T. *A Long Term Plan for a Shop Program in the Texas State School for the Deaf, with Emphasis on Woodworking as the Initial Course.* M. Ed., 1950, Agricultural and Mechanical College of Texas. 80 p. Department of Industrial Education, Agricultural and Mechanical College of Texas, Arlington.

Purpose: To offer possible solutions to some of the problems with which an instructor of a shop program for the deaf is confronted and to present a long-term plan for a shop program which will provide appropriate shop instruction during the entire time a deaf child is receiving formal training.

Source of Data: A survey was made of the existing shop courses in schools for the deaf located in other sections of the United States. These findings and information concerning the shop programs in the secondary schools of Texas were used in compiling a course of study in shop work for the Texas School for the Deaf. The study was presented to the superintendent of the school for evaluation.

Findings and Conclusions: Existing types of industrial arts courses in the secondary schools were applicable to the teaching of the deaf. The plan was inserted into the curriculum of the Texas State School for the Deaf.

3761. MARTIN, JACOB HERMAN (M. A.). *Vocational Rehabilitation in Ohio.* Ohio State University, 1935. 91 p.

A study of the services available to the adult disabled of Ohio and how they may be prepared to earn a living. The agencies which assist in rehabilitation are considered along with the work done in this area by the elementary and secondary schools.

3762. McCAMMON, NORMAN B. (M. S.). *Vocational Rehabilitation for the Physically Disabled.* Indiana State Teachers College, 1940. 95 p.

A study containing data submitted by thirty-two states and the federal government regarding the kinds and types of training and services available to the physically handicapped. The vocations that the rehabilitated have followed are considered.

3763. McMAHON, EARL M. (M. S.). *A Course in General Metal Shop for Retarded Youth.* Colorado Agricultural & Mechanical College, 1951. 225 p.

A course of study in metal work adapted to retarded students of the Edison School of Tulsa. Fifty projects used as a teaching device are included. They are given in blueprint form, and each is described as a job sheet.

3764. McMINN, WILLIAM W. (M. S.). *A Study of the Vocational Industrial Courses of the Pennsylvania Public Schools and the Courses Selected by Rehabilitation Trainees.* Pennsylvania State College, 1938. 83 p.

A study of the training and placement of all peoples who have received help from the vocational rehabilitation service of the State of Pennsylvania. A description of the services offered by the industrial day, co-operative and trade extension programs under the auspices of the Pennsylvania public schools is given.

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3765. MOORE, ALFRED H. *Practices and Opinions Relative to Practical Arts Education for Mentally Retarded Secondary School Youth.* Ed. D., 1954, University of Missouri. 194 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the implications of practices and opinions in practical arts education for mentally retarded secondary school youth, for the implementation of such programs.

Source of Data: By information form, data on practices and opinions were secured from 154 administrators in 30 states. From information forms completed by 341 practical arts teachers of mentally retarded youth, opinions of the 51 best qualified teachers were used. Some data were handled on the basis of per cent of agreement, other data were handled by rank difference.

Findings and Conclusions: Considerable agreement and disagreement was found on objective, policies, and methods; administrative classification and teacher qualifications often resulted in differences of opinion. Shifts in emphasis and increase in practical arts were desired; but few schools had used job surveys and follow-up studies, and only the minority resulted in curriculum adjustments. Course and content selection criteria often varied in value between the two uses. The extent of use and instructional value of teaching aids and techniques were often at variance. Youth aged 13 through 15 should devote one-third of their school time to practical arts, those 16 and over one-half time. Practical arts should emphasize general homemaking, home mechanics—followed closely by arts and crafts and general shop—general agriculture, occupational training, and business training for personal needs.

3766. MUSSER, LAWRENCE L. *Vocational Guidance and Vocational Education for Crippled Children.* M. A., University of Michigan, 1933. 203 p.

A survey of what is being done vocationally for crippled children throughout the United States and Canada, with comparisons with several leading European institutions.

3767. NICHOLS, HOMER WOODARD (M. A.). *A Study in Special Education. The Rehabilitation Problem in Kentucky.* George Peabody College, 1931. 117 p.

A study to determine the number of persons needing the services of the division of vocational rehabilitation in Kentucky. They are classified according to residence, rural and city. The number of males and females, the number of white and colored, and the nature and origin of the disabilities are considered.

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3768. NILSON, KENNETH (Doctors). *Physically Disabled Persons in Minnesota and an Analysis of Certain Factors in Their Education and Vocational Rehabilitation.* University of Minnesota, 1931.

3769. OLSON, GEORGE W. *Drafting for the Physically Handicapped.* M. Ed., 1949, Wayne University. 38 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To examine problems in the teaching of drafting to the physically handicapped with varying degrees of disability of one hand and arm.

Source of Data: Data were obtained from books and periodicals, government publications, and personal interviews with leaders of special education programs.

Findings and Conclusions: It is possible to teach drafting to disabled people with varying degrees of disability of one hand. The special equipment needed in this program is not beyond the ability of any school section to provide. Industrial arts teachers not preparing for special education teaching positions could profit from taking a survey course in special education of the handicapped to be prepared for special students who might be admitted to their classes.

3770. PENN, WILLIAM K. (M. S.). *Vocational Rehabilitation—A Study of Two Hundred and Five Cases Closed as Rehabilitated during the Period from 1935 to 1940.* The Stout Institute, 1941. 40 p.

An investigation of the effectiveness of the rehabilitation program in Wisconsin based on a study of rehabilitation cases. Consideration is given to the selection, physical restoration, counseling, training, and placement of those studied.

3771. PENNY, FOREST L. *Industrial Arts and Its Contribution to the Education of the Blind.* M. S. in Ind. Ed., Kansas State Teachers College, 1947. 77 p.

The report indicates the scope of the training program for the blind in the several states and the possible contribution industrial arts might make.

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3772. PRITCHARD, MIRIAM C. (Ph. D.) *The Mechanical Ability of Subnormal Boys.* Columbia University, 1937. 73 p.

An experimental study which attempts to point up some factors, apart from intelligence, which might be contributing forces in the trade training performance of subnormal boys. Adolescents in one institution and of one ethnic group, namely, Jewish, are discussed.

3773. ROBINSON, K. LOIS (Masters). *A Study of Occupational Therapy and Its Interrelation with Subsequent Vocational Rehabilitation.* University of Southern California, 1932.

3774. SCURLOCK, VOYLE C. (Masters). *Economic Aspect of Vocational Rehabilitation.* Oklahoma A & M College, 1936.

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3775. SEEHOFF, JESSE (Doctors). *Hand Craft Curriculum for Dull Normal Pupils: Its Importance in Crime Prevention.* New York University, 1942.

3776. SEYLER, LOUISE WOOD (M. A. in Ed.). *Vocational Opportunities for Children of Border Line Intelli-*

gence. University of California at Los Angeles, 1938. 85 p.

The study attempts to determine the employment possibilities offered by industry to boys and girls of low mental ability. Educational provisions and vocational opportunities for these pupils in Los Angeles from 1915 to 1918 are discussed.

3777. SHEATHELM, WAYNE CLARENCE. *A Survey of the Vocational Education Facilities in Residential Schools for the Deaf in the United States.* M. A., 1953, University of Michigan. 53 p. Library, University of Michigan, Ann Arbor.

Purpose: To gather information that would be of help to vocational shop teachers in their own programs in the various schools.

Source of Data: Data were obtained from a questionnaire sent to all residential schools in the United States and from the American Annals of the Deaf and other deaf and special education magazines and pamphlets.

Findings and Conclusions: It appears that schools for the deaf do not make a clear distinction between industrial arts and vocational education. Six to eight trades constitute the majority of the schools' offerings in advanced training. The teachers are especially well prepared for the specific fields in which they are teaching. The length of vocational courses was from 1½ to 2 hours daily for three to four years in a particular trade. Opinions expressed indicate that the time would be extended if money and personnel were available.

3778. SOUDERS, ROBERT E. *The Value of Industrial Arts and Related Activities in Special Schools for Exceptional Children.* M. S., 1951, Kansas State Teachers College. 74 p. Industrial Education and Art Department, Kansas State Teachers College, Pittsburg.

Purpose: To indicate the value of industrial arts and occupational therapy in special schools for exceptional children.

Source of Data: Data were obtained by contacting directors of special schools and analyzing written materials on the subject.

Findings and Conclusions: A comprehensive industrial arts shop with a wide selection of crafts media and materials would provide for better mental, physical, manipulative, moral, and emotional growth of the exceptional child.

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3779. STANTON, MILDRED BACON (Ph. D.). *The Mechanical Ability of Deaf Children.* Columbia University, 1938. 65 p.

The purpose of the study was to evaluate the mechanical ability of two groups of deaf Children in order to provide wise educational guidance and effective curricula for deaf children. Each group consisted of 121 boys and 36 girls ranging in age from 12–0 to 14–11.

3780. STEPHENS, J. BRYANT. *Industrial Educational Needs for Deaf Children in Oklahoma.* M. S., 1950, Oklahoma Agricultural and Mechanical College. 74 p. Library, Oklahoma Agricultural and Mechanical College, Stillwater.

Purpose: To investigate the physical plant of the Oklahoma School for the Deaf, its curriculum, the industrial education department, and to conduct an occupational survey of former students.

Source of Data: Questionnnaire technique was used for primary data. Secondary data were secured by reading literature in the field of normative-survey research.

Findings and Conclusions: The physical plant seems to be adequate for the care, comfort, and physical well-being of the student group. Facilities for teaching the deaf equal those found in most State schools. The academic department includes 3 divisions designated as lower, middle and upper. Industrial arts and vocational industrial education are offered in the school for both boys and girls. Eighty-two percent of former students surveyed were working and 5 percent were attending college.

3781. THISSE, CARLTON E. *A Study of Handicapped Students in the Special Industrial Arts Program at Lowrey School, Dearborn.* M. Ed., 1953, Wayne University. 29 p. Department of Industrial Education, Wayne University, Detroit, Mich.

Purpose: To ascertain the extent to which students with various handicaps have been able to adjust to normal class situations and normal work situations as a result of industrial arts activities integrated with their academic work and how this program can be changed to better serve future students.

Source of Data: Data were obtained from the compilations and interpretations of reports obtained from former students of the writer.

Findings and Conclusions: Recommendations were made for improvement of the program and problems for additional study were proposed.

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3782. USDANE, WILLIAM MILLER. *A Comparative Study of Vocational Rehabilitation Legislation for the Severely Handicapped Orthopedic Civilian in Great Britain and the United States.* Ph. D., 1955, New York University, 436 p. Library, New York University, New York.

Purpose: To present, analyze, compare, and evaluate legislation pertaining to the vocational rehabilitation of the severely handicapped orthopedic civilian and to propose recommendations for the development of effective legislation to provide comprehensive vocational rehabilitation services.

Source of Data: The major hypothesis of the study was tested by the application of the criteria established from the writings of five national and international figures in the field of rehabilitation to the current legislation of Great Britain and the United States in this respect. Questionnaires were sent to the 48 States and the District of Columbia and to the Ministry of Labor and National Service and of Health in Great Britain.

Findings and Conclusions: There is a considerable difference between the number of severely handicapped orthopedic civilians in Great Britain and the United States and the legislation which provides assistance for them. A more positive role is assigned to the central government in Great Britain where civilians and servicemen are treated by the same legislation. In the United States legislation for each is separate. In Great Britain the government has established sheltered shops for the severely handicapped while the United States through legislation has done little due to a lack of proper facilities. Voluntary agencies in the United States work more with these handicapped civilians than do the government agencies while the opposite is true in Great Britain.

3783. WARD, CLIFTON FRANCIS (M. S.). *A Study of Vocational Rehabilitation in Utah.* University of Utah, 1939. 75 p.

Analysis of 126 case studies of rehabilitated persons in Utah and an evaluation of the state's program in terms of regional and national averages.

3784. WATSON, FLOYD WENDELL. *A Proposed Program of Industrial Arts For Slow Learning Children in Central Grammar School, Jacksonville, Florida.* M. A. E., 1953, University of Florida. 173 p. Library, University of Florida, Gainesville.

Purpose: To revise and enlarge the offerings of the general shop curriculum so as to provide exploratory experiences, essential introductory material, and occupational information for slow learning children.

Source of Data: Data were obtained from experience as an industrial arts teacher for slow learning children, from consultation with other teachers of slow learners, and from a number of technical and professional publications.

Findings and Conclusions: The report contains proposed program of general shop instruction for slow learning children at the elementary school level.

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3785. WILBUR, LOUISE (Ed. D.). *Vocations of the Visually Handicapped: A Study of the Need of Vocational Guidance in Residential Schools for Blind.* University of California, Berkeley, 1931. 398 p.

A study of the vocational opportunities of the blind and partially blind, with implications for guidance of the blind. The training of the blind from earliest history to the present, and opportunities for training, and employment are reviewed.

3786. WILT, WILLARD H. (Masters). *Practical Arts Education for Mentally Retarded Boys.* University of Southern California, 1932.

Work Experience

3787. BAKER, JOHN E. *Extent and Nature of Outside Jobs in Industrial Arts Shops.* M. Ed., 1953, Colorado Agricultural and Mechanical College. 129 p. Library, Colorado Agricultural and Mechanical College, Fort Collins.

Purpose: To ascertain the extent and nature of outside work done in industrial arts shops, and the basis upon which these jobs should be accepted.

Source of Data: Data were obtained from questionnaires sent to 100 industrial arts instructors and administrators in high schools of southern Illinois.

Findings and Conclusions: Most outside jobs done in industrial arts shops were for the school. "Reduction in costs of physical equipment and maintenance" was the main reason given by instructors for accepting outside jobs, whereas administrators emphasized "creating live jobs". Both groups indicated that outside jobs tend to deflect from course of study and make teaching more difficult. Most outside jobs were channeled through instructor, though many were channeled through administrators. Both groups agreed that if outside jobs are accepted they should conform to the course of study, be accepted only if class time permits, and be within students' ability.

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3788. BASKIN, SAMUEL. *The Graduate of the College Work-Study Program.* Ph. D., 1954, New York University. 190 p. Library, New York University, New York.

Purpose: To ascertain the relative effectiveness of a college work-study program in aiding students in their occupational selection and in contributing to their later job satisfaction and occupational success.

Source of Data: Data were secured through a questionnaire sent to all graduates receiving their degrees during the period, 1939–41. Two groups were compared: a group who participated in the Antioch work-study program and a comparable group of Oberlin graduates who had not participated in such a program.

Findings and Conclusions: Statistically significant differences in favor of the work-study group were evidenced with regard to the certainty of the graduates as to their occupational choices at the time of graduation, the time of their choices, and their satisfaction with the career-planning contributions of their college program. No statistically significant differences were found between the groups with respect to their present job satisfaction and field of employment twelve to fifteen years after graduation. A consistent trend in favor of the work-study group to command higher salaries existed but it failed to meet the limits of statistical significance. Approximately three-fourths of the work-study group stated their college work was important in their career planning. Both groups stress the need for more effective counseling.

3789. CARPENTER, JAMES R. (Masters). *A Critical Analysis of the High School Wartime Work-Experience Program.* University of Southern California, 1946.

3790. ERIKSON, EDITH ALPHA. *A Survey of Work Experiences of the Junior and Senior Students in the Muskegon Heights Senior High School.* M. A., University of Michigan, 1943. 103 p.

This study is an attempt to learn how many pupils of this Michigan high school during the year 1942–43 were working outside of school hours; what these work experiences were like, and their values; and what the school could do to help the pupils prepare for, and adjust to, such experiences.

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3791. EVANS, WILSON ARNOLD. *Increasing the Educational Values of the Berea College Work Program.* Ed. D., 1954, Columbia University. 182 p. Teachers College Library, Columbia University, New York.

Purpose: To plan and carry out a change in a practical education situation. To develop and put into effect policies and procedures which would cause students to derive greater educational benefits from their work.

Source of Data: Data were secured through a study of work programs in other colleges and Berea College, a literature survey, and a study of Student Personnel Administration and courses of study.

Findings and Conclusions: Work program should continue with greater emphasis on educational values; personal practices should be made more effective and human resources used more advantageously with improvement of administrative policies and procedures.

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3792. GAINES, THOMAS R. *Relation of Work Experience in Industry to Industrial Arts Teaching Practices and Success.* Ed. D., 1955, University of Missouri. 166 p. Library, University of Missouri, Columbia.

Purpose: To ascertain the relationship of work experience in industry to teaching practices and rated teaching success of industrial arts teachers.

Source of Data: Through information forms data were obtained concerning work experience in industry and certain teaching practices followed by industrial arts teachers. Evaluation was made of these practices by 50 industrial arts teacher education specialists. Ratings of teaching success were obtained from 88 local industrial arts supervisors on a scale constructed for this purpose. Fifty-one non-work and 98 work experience teachers were compared: (1) with each other on teaching practice followed, (2) with specialists recommendations on the use of these practices, and (3) with each other on supervisory ratings of teaching success.

Findings and Conclusions: One significant difference was found between non-work and work experience teachers on teaching practices followed regarding industrial arts shop safety, and care and maintenance of equipment. Both groups tended to differ to about the same degree in the extent of use of practices from that recommended by specialists. Non-work and work-experience teachers did not differ significantly on any of the eighteen items rated by the supervisors on teaching success. There seems to be little or no relationship between whether or not industrial arts teachers have work experience in industry and teaching practices followed regarding: conservation of students' time in school shop work, project cost and elimination of waste, selection of course content, teaching methods, techniques, shop housekeeping, and shop management. There seems to be little or no relationship between whether or not industrial arts teachers have work experience in industry and the teaching success ratings given by industrial arts supervisors.

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3793. **HENDRIX, SAMUEL DAVID** (Ed. D.). *The Educational Values of the National Youth Administration Work-Program in Texas.* University of Texas, 1942. 179 p.

A critical examination of the NYA work projects in Texas, with implications for the public schools. Questionnaires were sent to 1702 NYA enrollees and supervisors and personal investigations were made of twenty-two NYA work-study projects in Texas.

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3794. **IVINS, WILSON HOWARD.** *Objectives and Principles of High School Work Experience.* Ed. D., University of Colorado, 1947. 452 p.

A descriptive analysis of the objectives and work experience programs as determined by: (1) A study of the literature of the field; (2) visiting and observing high school work programs in operation; (3) securing historical and other data from primary sources through correspondence; (4) securing facts and opinions in regard to the status of work experience in the several States from State departments of education; and (5) securing the opinions of educational specialists in the fields of secondary education, vocational education, philosophy-curriculum, and high school administration or work experience coordinators.

3795. **JOHNSON, LLOYD W., AND WILLIAM H. ROE.** *Review of Current Literature on Work Experience Programs (A Special Study).* Office of Vocational Education, University of Michigan. 50 p. Not available for distribution.

Purpose: To provide information for the Michigan Committee on Education for Occupational Competence covering the role which work experience programs might play in the regular school curriculum.

Source of Data: Thirteen pieces of literature dealing with work experience programs in various parts of the country were studied. Digests were made based on the types of work experiences, the benefits of work experiences, and recommendations. This information was compiled into one unit, including a bibliography composed of 59 references.

Findings and Conclusions: Reports received indicated four types of programs involving work experiences generally in effect. These included cooperative training, farm work experiences, apprenticeship training, and on-the-job training. Twenty-eight benefits of work experience were extracted from articles submitted. Twelve recommendations for work experience programs were extracted from the articles summarized in the bulletin.

3796. **KARNES, J. W., *Jr.*** (M. S.). *To Determine the Value of Work Experience for Prospective Industrial Arts Teachers.* North Texas State College, 1947. 83 p.

A study of the types of work industrial arts teachers are asked to do, their evaluation of work experience, and need for additional shop training.

3797. **LANGLAND, RUTH MARIE.** *A Survey of Work Experience in the High Schools of Michigan.* M. A. in Bus. Ed., 1950, University of Michigan. 61 p. Education Library, University of Michigan, Ann Arbor.

Purpose: To discover to what extent the schools are providing work experience for high school students, under what type of program, if any, and in what fields; by such discovery to aid schools thinking of instituting a work experience program.

Source of Data: First, a postcard survey was sent out to the high schools asking for cooperation, and then a questionnaire was sent to those schools indicating they had something to contribute. Results were tabulated and conclusions drawn.

Findings and Conclusions: Guidance is considered by most people in the field as one of the most necessary parts of a work experience program, yet it is omitted or at best given a very small part by the greater number of schools in Michigan. If the programs are to be successful in the long run, it will have to contain guidance measures in a complete form; definitely including guidance workers and coordinators who have enough time to do an adequate job. The fact that most of the students on the work experience programs are obtaining permanent employment in the companies in which their experience is gained or in similar companies shows that employers are recognizing the value of the programs. More and more the schools of Michigan seem to be recognizing the need of many students for work experience before leaving school. When the curriculum does not fill the needs of the students it is up to the school to provide something to fill those needs. Michigan schools, with gathering momentum, are meeting this challenge.

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3798. MEIERHENRY, WESLEY C. (Doctors). *A Vocational Education Program for the Small High School Utilizing Supervised Correspondence Study and Work Experience.* University of Nebraska, 1946.

3799. MEYERSIECK, MARION C. *An Analytical Study of a Group of Ninth Year Pupils Engaged In Part-Time Employment in the Fall of 1943.* M. Ed., St. Louis University, 1945. 84 p.

A study of pupils of a ninth grade engaged in part-time employment and its effect upon their academic records. Author maintains that the daily strain of a school work program is evidenced in irregular attendance, failures, and poor health.

3800. SAMUELSON, CECIL OSBORN. *The Working High School Boy in Salt Lake City.* M. S., University of Utah, 1942. 116 p.

A survey of the senior high school boys of Salt Lake City who were working part-time showing the general characteristics of the boys between the ages of 15 and 18; the nature and extent of the gainful employment; the hazards to health and morals in such employment; the means by which the boys secured their jobs; and the interrelationships of the home, the job, the school, and the boys' interests as they operate to mold personality.

3801. WHITTENBERG, GLENN (M. S.). *To Determine Those Work Experiences of Value to Prospective Teachers of Industrial Arts.* North Texas State College, 1948. 94 p.

A compilation of opinions secured by a questionnaire sent to high school industrial arts teachers concerning the value of their industrial experience.